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Risk, science and policy: definitional struggles, information management, the media and BSE

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Abstract

This article examines the role of definitional struggles in the science–policy interface using the example of the cattle disease bovine spongiform encephalopathy (BSE) or mad cow disease in the UK. A central contention is that an explicit focus on definition illuminates the processes by which scientific judgements are made, promoted, communicated, assessed and judged and gives an improved picture of policy making. Neglected areas such as the role of secrecy, public relations and the mass media in the science–policy interface are brought into sharper focus as an intrinsic part of the wider operation of definitional struggles. The focus on definitional struggles also sheds light on some current work on risk in social theory. It is argued that the neglect of questions of agency which are central to definitional struggles has led to some theorists presenting risks as inevitable concomitants of technological and cultural developments leaving them in the grip of political quietism. © 1999 Elsevier Science Ltd. All rights reserved.

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Introduction

Risk controversies have become a staple of contemporary public life. They inevitably involve scientists and policy makers in the assessment, judgement and communication of risks. This article examines the role of definitional struggle in risk controversies and in particular in the science–policy interface. An explicit focus on the means by which certain definitions of problems come to be accepted in the scientific literature or in policy debates highlights the communicative aspect of policy and decision making. Thus the genesis of scientific questions, the manner in which they are investigated, the process by which ‘experts’ are involved in

policy advice, the political management of scientific expertise, secrecy and the promotional strategies used to present science all become pressing questions. Conceptualising the policy process in this way also enables the theorisation of the public sphere and specifically the mass media as crucial components in the rise and fall of social issues and in the science–policy interface. The principal empirical material on which the argument is based relates to the British experience of bovine spongiform encephalopathy (BSE), popularly known as mad cow disease.

Some background concerns

This paper draws on three areas of social scientific concern; work on the role of the media in contemporary societies; political science and policy studies work

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on policy making processes; and risk in recent social theory.

Firstly, there is a long running interest in media and cultural studies in the role of institutions of mass communication in reproducing or transforming configurations of culture and society. A key concern has been in the way in which media institutions have undermined or reproduced the definitions of their sources in government, business or interest groups. There has also been an interest in the contribution of the media to policy and decision making in contemporary societies. However, until recently most work in this area was 'media-centric' in that it tended to neglect the activities of organisations trying to influence the media. When it did examine them, it generally did so by collecting evidence from the perspectives of journalists or — at a greater remove — by speculating on the activities of journalists' sources on the basis of analysis of media content (Ericson et al., 1989; Schlesinger, 1990). Recently there have been a number of studies which have attempted to examine the process by which definitions are produced by the media from the perspective of both journalists and their sources (e.g. Ericson et al., 1989; Cook, 1989; Anderson, 1993; Miller, 1993, 1998a; Miller and Williams, 1993; Deacon and Golding, 1994; Miller and Reilly, 1995; Schlesinger and Tumber, 1994; Miller et al., 1998). However, to the extent that such work is about definitional struggles in society it runs the risk of being media-centric in another sense. Definitions of social problems (or of scientific issues) are not only made in the mass media. In the case of risk controversies they also appear in scientific journals, at academic conferences, in peer review and in research proposals, in expert advisory committees, in legal and regulatory fora and amongst policy makers and politicians. The logic of examining the genesis of definitions in the media implies the direct investigation of the process of production of definitions in other arenas. This paper advocates such an approach and consequently examines the social production of knowledge by experts and policy making processes as well as by the mass media. This takes media studies well into the territory of mainstream sociology and political science and could promote interdisciplinary sharing of insights.

For their part political science/policy studies and the social theory of risk have tended to be somewhat media averse in that very little of the literature theorises — or even mentions — the media. (For example,

on risk see Giddens, 1990; 1991; 1994; Beck, 1992; 1995; 1996; Adams, 1995; Wynne, 1996b; on policy, Greenaway et al., 1992; Smith, 1993; on science policy Wilkie, 1991; on pressure groups, Grant, 1995; Richardson, 1993; on health policy, Doyal and Pennell, 1979; Levine and Lilienfeld, 1987; Ham, 1992; Navarro, 1994; Allsop, 1995; Klein, 1995. Walt (1994) is a partial exception). One possible reason for this is that definitional aspects of policy making have been neglected so making it harder to integrate and conceptualise the media in discussions of policy processes. Definitional struggles have also been marginalised in much recent theoretical writing on risk partly because theory often operates at a level of analysis which is remote from and difficult to test against empirical detail. They have also been marginalised because notions of agency are — at least — underdeveloped in such work (e.g. Giddens, 1991; Beck, 1992; Beck et al., 1994). It is argued here that an explicit focus on definitional struggles and conflicts which permeate the entire policy process provide a valuable corrective to those approaches which either neglect communication in the policy process or discuss it only in relation to the mass media.

Science and decision making

Many areas of government policy are claimed to be based on the best available scientific advice or risk assessment. Natural science and to some extent social science research is formally expected to feed into policy making. For example successive government ministers in the UK have claimed that policy on BSE is straightforwardly based on science. The first quotation is from Minister of food David Maclean and the second (six years later) from Health Minister Stephen Dorrell (*BBC News*, 13.00 16 May, 1990; *Channel Four News*, 20 March 1996, respectively):

our policy is based on the best scientific advice from the independent experts

What I'm here to do is set out clearly what is the basis of the scientific evidence that has been assessed by these experts. I think it's important that the policy response... rests securely on the science.

Underlying such statements are models of the policy making process as a bureaucratic or technical matter. Policy making is seen as a process of selecting policy options rationally from alternatives and as firmly based on scientific endeavour. Science is assumed to produce neutral, unvarnished findings to the best of its ability and for those findings to be prior to policy decisions¹. Following the BSE crisis a more sophisticated official version of the relationship between science and

¹ See the discussion and critique of various approaches (such as the rational actor model, bounded rationality, disjunctive incrementalism, the organisational process model, the bureaucratic politics model etc) in political science in Greenaway et al., 1992.

policy was drafted by the British government's Chief Scientific Advisor, Sir Robert May, noted by one observer as a 'breath of fresh air in the corridors of Whitehall' (Ford, 1996, pp. 192–193). This recognised both the potential for scientists to be divided and for the existence of uncertainty. Furthermore it recommended that scientists be involved in helping to 'frame and assess' policy options (May, 1997, p. 5). Nevertheless the document provides no mechanism whereby science advice can be translated into policy; this is assumed to happen almost naturally and certainly apolitically. It also completely fails to recognise that value positions and political assumptions are fundamental to the framing of both policy and scientific questions by arguing that 'aggregates' of scientific advice are possible and can be 'consistent across different policy areas' (May, 1997, p. 6).

If this rational or technical process fails to occur, internal or external factors are blamed. Internal factors tend to include some technical problem of internal procedures, mistakes or communication breakdowns. External problems include the intervention of other bodies (whether governmental, business or interest groups) and limitations on rational policy making imposed by media publicity or public reactions. For example, in an apparent reverse of its previous policy, the British government claimed in the summer of 1996 that its policy was constructed to placate consumer worries about beef safety, rather than being based on science.

This paper argues that this simple version of the policy making process is inaccurate in that the process by which policy decisions are taken and implemented is much more complex and interactive. It is the result, not of rational or technical procedures, but of political contest and struggle. The paper does not argue that 'expert' advice is or should be irrelevant to policy making or has no impact on policy decisions. Rather, it is maintained that the generation, communication and promotion of expert advice itself is an integral part of the policy process. Expert assessments are not simply political, but neither are they straightforwardly neutral and factual.

There are perspectives on policy making which would concur and also want to place questions of power and struggle at the centre of an account of policy making in advanced capitalist societies. Greenaway et al., (1992, p. 239) argue that studies of policy making tend to deal essentially with the process by which policies get made rather than what policies are made and can as a consequence foreclose questions of power and influence. However, questions of power and influence can also be sidelined in some approaches which examine only outcomes and neglect the process by which decisions come to be made. One key reason is that focusing on processes or on out-

comes neglects the key question of why some issues come to be issues in the first place (and why others do not). This may sometimes be due to an overly objectivist account of social problems — the assumption that the objective severity of a risk (however defined) leads to it becoming a public policy issue. A focus on definitional strategies makes it possible to relate the specifics of the policy process to questions about the rise and fall of public issues and about the wider interests involved in and affected by policy making.

Risk society and high modernity

Some social theorists have claimed that risk controversies are distinctively new phenomena and that they reflect a profound transformation in social, political and cultural life. We are told that we are now living in a 'risk society' (Beck, 1992) or in an 'environment of risk and chance' (Giddens, 1991, p. 109). For Giddens, in the present period 'the baseline for analysis has to be the *inevitability* of living with dangers which are *remote* from the control not only of individuals, but also of large organisations, including states' (1990, p. 131). Giddens is talking here of 'low probability high consequence risks' which 'are the result of the burgeoning process of globalisation' (1990, p. 133) and form one segment of the 'generalised 'climate of risk' characteristic of late modernity' (Giddens 1991, p. 123). Giddens is not suggesting that life is more risky in the contemporary period than previously, but that there is an increase in risks produced by technological innovations partly through unanticipated consequences. Giddens suggests that one of the distinguishing features of late modernity is the increasing unknowability of such risks. By this he appears to mean that science and medicine are increasingly uncertain and that 'experts' are divided in explaining even well known conditions such as coronary heart disease. This uncertainty fits well with work on the sociology of science which emphasises the contingency of scientific knowledge (Latour, 1987; Mulkay, 1991) as well as writings on scientific controversy and social problems (Aronson, 1984; Engelhardt and Caplan, 1987; Nelkin, 1992).

These characterisations of science and society see the contemporary social environment of risk as general or inevitable. Yet the extent to which the emergence and trajectory of risk controversies conforms to such macro theories has been infrequently tested. They argue that risks are a feature of modernity over which human control is attenuated. Yet it seems clear that different decisions in the regulation of and response to

risks would alter the scale or even existence of specific risks².

The argument advanced in this paper is that the social production of risks in the public domain is not the inevitable concomitant of 'reflexive modernity' or of 'high', 'late' or even 'post' modernity, but is the product of the pursuit of definitional and material advantage in the context of already existing (definitional and material) conditions. This article tries to point to new ways of examining the emergence of public issues, the process by which risks are defined as policy issues and how they are dealt with. It identifies non 'mass media' processes as a topic for studies of definitional advantage, argues for the central role of the mass media in the rise and fall of public issues, examines policy processes from the perspective of definitional struggle and argues for the restoration of a sense of agency to risk theory.

Risks do not emerge as issues for the media, the public or even for experts according to their intrinsic importance, but in interaction with social processes including bureaucratic procedures and promotional strategies (Kitzinger and Reilly, 1997). It is necessary for some issues to command attention, claim legitimacy and invoke action (Berridge, 1992, 1999 cf. Murdock, 1993) in the media or on the agenda of experts, policy makers or even the public (whose opinions are rarely the source of policy initiatives). There is a clear case for investigating these dynamics if we are to better understand the nature of risk, science and decision making in contemporary societies and what can be done about them.

² Various at the natural, material, cultural and symbolic levels. There might really be less dead or we might conceptualise the problem so that less of the dead are included or some combination of both.

³ This is an extremely unusual infectious agent because it is devoid of DNA. The theory of prions is associated with the work of Stanley Prusiner (e.g. 1995), but it is contested in the scientific literature. Such contests are important in the policy arena (and even more so in professional science) as well as in combatting BSE, but they are not the subject of this piece. Moreover, for our purposes we can note that policy making discussions during the 1987–1996 period related more to the question of how the infectious agent (whatever it was) was being transmitted. The key point is that given the scientific, policy and sociological knowledge circulating in the policy community at the time differing policy options were available. In paractice the lack of scientific certainty did not determine and could not deter the practical policy decisions which were taken.

BSE: contextual factors

The case considered here is that of BSE (bovine spongiform encephalopathy) also known as 'mad cow disease'. Before we review some of the definitional struggles in this case we need to consider briefly the background to BSE and some contextual developments in the regulation of science on which the development of BSE was contingent.

Bovine spongiform encephalopathy was first identified in Britain in November 1986. The first published account of it appeared in the British Veterinary Association's *Veterinary Record* almost a year later in October 1987 (Wells et al, 1987). BSE is thought to have occurred as a result of cattle eating infected animal remains which were present in animal feed. The infectious agent is thought to be a type of protein called a prion, which is resistant to destruction³. Naturally, therefore there are all sorts of uncertainties about the precise origins of the disease, the nature of the infectious agent, the methods of transmission, but there is widespread agreement that ingestion of infected animal remains (whether sheep or, later, cattle) was a proximate cause. There was one dissident theory, associated with the organic farmer Mark Purdey, that BSE is the result of the use of organophosphate pesticides, but this received little backing from either official or dissident scientists (for discussions, see Lacey, 1994; Dealler, 1996; Ford, 1996). In May 1988 the first government committee was appointed under Sir Richard Southwood, their report was published in February 1989 and a second committee under Dr. David Tyrrell set up. From the beginning the Ministry of Agriculture, Fisheries and Food (MAFF) have stated that policy decisions have been based on the best available scientific evidence and advice. However, two points are worth noting: the actual development of the disease has not matched official projections (with some alleging that this was no accident) and BSE became a significant public controversy. Both of these points are relevant to a consideration of the developments of interactions between scientific advice, decision making and media reporting.

The growing convergence between the chemical and food industries and the escalating industrialisation of agriculture are key tendencies. This has resulted in the increasing application of technology to animal rearing, food production and distribution, so much so that the process of transforming crops and animals into food is now routinely referred to as food 'manufacturing'. The use of pesticides and the recycling of animal matter in livestock feed are two consequences which are alleged to be linked with the specific case of BSE. These tendencies have been accompanied by the increasing concentration of ownership of the industry by a small number of multinationals which continuously strive for

'efficiency' in food production in order to cut costs and increase profits. Such tendencies have meant a shift in power in the industry from food producers (e.g. farmers) towards food retailers and particularly food manufacturers (Hutchings, 1989).

Such processes have not been without their sometimes unintended (though hardly unanticipated) consequences such as impacts on animal welfare, the environment and on overproduction in a world of famine (Clutterbuck and Lang, 1982). There have also been implications for human health (e.g. food poisoning and other food related illness). Most relevant here is the recycling of animal remains in farm and domestic animal feeds.

In Britain there was also a concerted tilt to the market in government policy. The election of successive Conservative governments from 1979 had a number of consequences for the regulation of the food industry, such as the abandonment of the approach proposed by the previous (Labour) government. This would have meant that diseased animal material would have been kept out of animal feeds. Instead, the incoming government noted in its Proposed Protein Processing Order (issued by MAFF, 16 April 1980) that 'the new proposals reflect the wish of ministers that in the present economic climate the industry itself should determine how best to produce a high quality product'. This resulted in changes to the rendering of carcasses (lower heat and less solvents) which are alleged to have made the transmission of BSE easier.

The tilt to the market had other impacts on regulatory bodies and structures, scientific funding regimes and the recruitment and retention of experts by the public sector. First the privatisation, deregulation and hiving off of statutory bodies and the creation of executive agencies (such as the Central Veterinary Laboratory) by government has allowed market criteria greater power over regulation and governance. Ironically, however, executive agencies are not fully independent commercial organisations, but 'near market' agencies required to compete in the market and show a 'profit', but still formally subject to government rules and regulations. As such they remain constrained by the Official Secrets Act. Second, changes in the funding arrangements for the research councils and for scientific research institutes has meant that the market has a greater role in determining research rather than the priorities of either public policy or scientific progress. Associated with this is the transformation of research institutes into business organisations and the increased dependence of working scientists on commercial funding (Cannon, 1987; Pain, 1997). This in turn

decreases the already dwindling number of 'independent' scientists who can be called upon to advise government (Nowotny, 1981).

In summary then, trends in the food industry and in government policy have facilitated the emergence of risks such as BSE. While there remains uncertainty about the precise origins of BSE, the nature of the infectious agent and the route of infection, nevertheless some things can be said which help us to understand the shape, scope and timing of the rise and fall of BSE as a public issue.

Defining the problem

The objective natural characteristics of BSE have not determined the development of BSE as a public issue in any straightforward way. On the contrary the way in which the problem was initially defined in expert and policy discourse as an animal health problem was of key importance in shaping official responses (and media reporting). If it had been defined as a potential public health issue, the precautionary principle was more likely to have been applied (as it had been in other issues such as AIDS (Berridge, 1995) and in veterinary matters, foot and mouth disease). However, BSE first became an issue for government through the veterinary diagnosis of the disease which was reported to the MAFF Central Veterinary laboratory in Weybridge. Thus at the start it was a MAFF responsibility. However, the first 'expert' committee under Professor Richard Southwood was appointed jointly by MAFF and the Department of Health and part of its remit was to examine the possibility of a risk to humans. Subsequently, the Southwood report was accepted in policy circles as closing the question of human risk and so the Department of Health was virtually excluded from decision making and MAFF became the lead department on BSE. As a very senior medical source in the Department of Health recalled:

Basically having looked at the report the Health Secretary, said 'OK it looks to me that the health implications of this are, if any, minimal or not at all. In future MAFF is in the lead'⁴.

In practice this meant that Department of Health officials were unable to speak independently to the media and even the most senior officials required the approval not of their own Secretary of State as would be usual, but of the Secretary of State for Agriculture⁵. British network TV news coverage of BSE between 1987 and 1991 featured the Department of Health's Chief Medical Officer only four times in comparison with the Chief Vet who was on 15 times and the Secretary of State for Agriculture who was on 49 times

⁴ Interview with the author, February 1994

⁵ Interview with the author, February 1994.

(Miller and Reilly, 1995, p. 331). Equally the Public Health Laboratory Service and the Communicable Diseases Surveillance Centre took no part in research on BSE. As a Public Health Laboratory Service scientist put it:

We were told that we had to send everything to MAFF. Everybody wanted to know why... It was obvious to us that this was a public health issue. We were all ready to move... and then we had to stop. The word from above was that it was MAFF's thing⁶.

A key factor here was the *Salmonella* crisis of December 1988, over which the DoH and MAFF were seriously divided (Miller and Reilly, 1995). A DoH civil servant explained:

our whole department and PHLS took a great beating over salmonella and it was all done in public of course. We did lose out because salmonella cost so much money and that made everyone out to look incompetent as they were all saying different things... That was really a turning point... We learnt that we had to be ultra careful about what people said, word came from the top that care had to be taken in all aspects of the job. There was no way another fiasco was going to be allowed to happen⁷.

Defining the salmonella affair as the fault of public health interests made it easier, and MAFF more determined, to sideline them over BSE. Furthermore, the scope for public health researchers, or critics of the official position more generally, to get involved in the debate was limited by the culture of public organisations in Britain. For example, some researchers who have published work in the area have experienced pressure. According to one public health researcher:

I've had criticism from my own health authority about getting involved in political aspects. It wasn't for me as what was described as a 'back-room researcher' to be commenting on these things of national importance⁸.

This takes place against a background of growing job insecurity in the National Health Service (NHS) which has led, according to this researcher to:

a fear amongst public health professionals that if they were to say anything which was contrary to

the party line on this that they might be victimised in some way... There are ways of getting rid of people, particularly through restructuring and I think that people are genuinely afraid to say too much about this in case they lose their jobs.

Ministry of Agriculture officials also became more important in official and research funding committees. In particular the MAFF coordinator on BSE, Ray Bradley, participated in many of the major committees inside Whitehall (e.g. MAFF observer on SEAC, member of the EC Scientific Veterinary Committee, member of the Advisory Committee on Dangerous Pathogens/SEAC working group, advisor to the Chairman of the Expert Group on Animal Feeding Stuffs) and on funding council committees (as well as being appointed on the Spongiform Encephalopathy Advisory Committee (SEAC) on his retirement in 1995). Civil servants were also heavily involved in the process of reviewing papers for publication in scientific journals as part of the peer review system.

Scientific committees

Scientific advisory committees are supposed to present policy makers with the best scientific advice. In the crudest versions of this process as advanced in government publicity statements, the science is unvarnished and plays a strong determining role in policy decisions. There is a contradiction here, since even the best science cannot determine policy. Decision making is a different order of process from ascertaining the 'hard facts' of science (Weinberg, 1972). The same evidence can be used to inform or influence differing policies. Equally to the extent that scientific committees recommend particular policy options, they have departed from strict science.

However, in practice, such simplistic distinctions between science and policy underestimate the extent to which scientific advice and research depends partly on how a problem is conceptualised. Furthermore, government publicity statements about scientific advice are no guide to the practical politics of expert advisory committees. The process of appointing and running committees, drafting and redrafting reports and then publishing and promoting them can be fraught with problems of conflicting expectations, agendas and priorities.

First of all members of advisory committees are carefully selected. Richard Lacey reports his experience of being appointed to the MAFF Veterinary Products Committee: 'prospective members are to varying degrees vetted' on their 'general views and philosophy of life'. He claims he was appointed because he then held the view that the dangers of bacterial resistance to

⁶ Interview with JR, November 1995.

⁷ Interview with JR, September 1995

⁸ Interview with JR January 1995

antibiotics could be laid at the door of human use rather than animal use in intensive farming. The first expert committee on BSE set up under Sir Richard Southwood, contained no experts on scrapie or transmissible spongiform encephalopathies (TSEs), nor were many of the available experts (in Britain or the US) called to give evidence. Of those who were called, Hugh Frazer of the Institute for Animal Health is reported to have been amazed that he was only asked ‘a few simplistic questions’ and not for his opinion on other pertinent areas of science (Dealler, 1996, p. 50).

The business of committees is conducted in secret. Members are reminded of the provisions of the Official Secrets Act and Ministry lawyers visit committees to issue specific warnings on breaches of confidentiality (Lacey, 1994, p. 57). Committees are attended by a variety of civil service support staff. According to Lacey this was important on the Veterinary Products Committee (Lacey, 1994, p. 56):

In addition to members being hand-picked, we were manipulated, controlled, influenced and sometimes threatened by the large number of ‘invisible’ civil servants always present. By ‘invisible’ I mean that their presence was never formally admitted in the published details of the membership of the committees. There were always more civil servants than members.

In fact the Southwood report was apparently written by the chair of the committee — a civil servant. The ‘experts’ were then required to approve it or alter the draft. However, this process apparently did not fully satisfy MAFF and further intervention was necessary. The Southwood report was delayed for seven months while officials reportedly attempted to “change the report’s emphasis. Officials also want some of the findings omitted from the version to be published” (Ballantyne and Norton-Taylor, 1989). According to members of the committee the report was altered and some of their concerns about a ban on offal in the food chain were not present in the published version (Interviewed on *Panorama*, BBC1 17 June 1996). Sir Richard Southwood, himself, later revealed that “we felt it was a no-goer. They already thought our proposals were pretty revolutionary” (*Panorama*, BBC1 17 June 1996). This is the basis on which MAFF and the government claimed that they followed scientific advice.

Scientific research agendas and funding

The framing of the issue as a veterinary health issue had a clear impact on the research which was deemed necessary. Additionally the ability of science to produce research in this area was compromised by financial difficulties experienced by the funding councils. The key result being that research institutes funded by the Agriculture and Food Research Council (later to be called the Biotechnology and Biological Science Research Council) experienced cuts in core funding and have been obliged to seek a much greater proportion of income from commercial sources (Winter, 1996).

However, in case there should be doubts about which research was ‘suitable’, senior Ministry officials have attempted to intervene in the process of awarding research funds. We understand that in the early 1990s the Chief Vet and a senior (Grade 3) civil servant personally put pressure on what was then the Agriculture and Food Research Council to send all applications for research on BSE to the Ministry. This approach was apparently rebuffed⁹. A number of researchers have also complained that MAFF blocked access to BSE infected material which from 1988 were automatically the property of MAFF (Dealler, 1996, pp. 60–64). More recently it has been revealed that epidemiological data was supplied to researchers only after “senior officials at the Royal Society put pressure on government ministers” (Butler, 1996b, p. 467). Furthermore, some MAFF funded researchers have been prevailed upon to direct their enquiries into areas which were likely to support the official line on risk to humans. As one neuropathologist whose lab is funded by both research council and government grants, put it

There was a structure set up which said that this disease was cattle scrapie. Sheep scrapie doesn’t do us any harm therefore this won’t either. Research was set up to prove this theory, much more pertinent evidence to the contrary was, shall we say, brushed to the side, for a while at least.

Furthermore, when research was carried out, MAFF has intervened to alter official reports and the contents of papers in scientific journals. Colin Whitaker, the vet who discovered the first cases in 1985, revealed in 1989 that: “They [MAFF] didn’t seem to want publicity with the disease... It did seem to me a little odd that we were asked to keep somewhat quiet”. In 1987 officials asked him to remove the term ‘scrapie-like disease’ in a scientific paper: “The word “scrapie” was deemed to be emotive and I was asked not to use it” (BBC Radio Four, *Face the Facts*, 18 May 1989).

⁹ Information from well placed AFRC/BBSRC source.

Promotional activity

Politicians also engage in public relations activities, which can further distort the picture of science given to the public. MAFF have used the full range of Whitehall information management techniques. In particular secrecy has been crucial. Early in the crisis (1990) the Agriculture Minister John Gummer took personal charge in the presentation of the disease. He became the pre-eminent spokesperson on BSE and the Ministry's veterinary scientists became less visible. Non-MAFF scientists were also instructed not to speak to the media. In 1989 Hugh Fraser at the Institute for Animal Health said on Radio Four's *Face the Facts* that he no longer ate bovine offals and that prudence would require that they were removed from human consumption. According to Fraser (Speaking on *Panorama*, BBC1 17 June 1996):

I and senior colleagues were told not to discuss these matters with the media and that if media questions arose they should be diverted elsewhere... The Ministry of Agriculture... preferred to manage the way in which this was presented and dealt with

We can see the Whitehall spin doctors in action on the publication of the Southwood Report. The joint MAFF/DoH press release stated that "the report concludes that the risk of transmission of BSE to humans appears remote and it is therefore most unlikely that BSE will have any implications for human health". This left out the qualifying clause of the report itself which stated: "With the long incubation period of Spongiform Encephalopathies in humans, it may be a decade or more before complete reassurances can be given" (MAFF, 1989). In addition the report concluded that it is "most unlikely that BSE will have any implications for human health. Nevertheless, if our assessments of these likelihoods are incorrect, the implications would be extremely serious". In the press release the word 'extremely' was omitted. For most of the period between 1989 and 1996 the government relied on the version given in the press release.

Similarly, papers published in scientific journals have been used in media relations and in lobbying processes. For example a prepublication copy of a paper by Collinge et al. (1995) was leaked to the media by a senior MAFF official together with a gloss which neglected the caveats in the paper and interpreted the results as favourable to the official line (Wynne, 1996a). MAFF also promoted an epidemiological analysis published in *Nature* as a vindication of their position, although other interpretations were possible (Butler, 1996a) and used it to lobby the European Commission to lift the world wide ban on British beef.

Nature complained: "The UK government's public deployment of a *Nature* paper encourages incorrect perceptions of the role of science... The role of science, with its attendant uncertainties, is to illuminate political choices, not to enforce them. By acting as if it is oblivious to this truth and to European political reality, the UK government can only erode its credibility further" (*Nature*, 1996a)

The role of the media

The mere fact that much time and energy is expended on promotional work and in policing secrecy is itself testament to the perceived importance of the media in the policy process. The media do not simply reflect controversy or help to "shape its portrayal" in the public sphere (Goodell, 1987, p. 595). The media coverage is an integral part of the controversy. Media reporting, public responses and specialist opinion are the context in which policy making functions and are part of the formula calculated by all participants in policy processes.

Judgements and decisions are arrived at with at least implicit assumptions about how they (or the way in which they are represented) will be received and about what is possible. These calculations were famously exposed in the Scott inquiry into covert arms sales to Iraq, where former Foreign Secretary Geoffrey Howe justified misleading parliament and the public on the basis that "if we were to lay specifically our thought processes before you, they are laid before a world-wide range of uncomprehending or malicious commentators. That is the point. You cannot choose a well-balanced presentation to an elite parliamentary audience" Alternatively, as Foreign Office Minister William Waldegrave put it, the change in arms sales guidelines was not announced because "we did not want to stir up a hornets' nest" (see Norton-Taylor, 1995, p. 96 and 67). Similarly, both MAFF and the Department of Health formulate policies with an eye on presentation and there is not always a clear line between science and decision making or, crucially, between science and communication and presentation. Scientists themselves, whether of their own volition or under Ministerial pressure, do make statements that depart from strict science. This is partly because it is perceived as difficult to acknowledge uncertainty to the public. Thus, a very senior medical official in the Department of Health commented:

you have to take a line... I mean what you cannot do... is to go to the ministers and say 'God knows — we don't know what is going to happen'. If you go out to the press and say we haven't the foggiest idea what is going to happen, what do you think

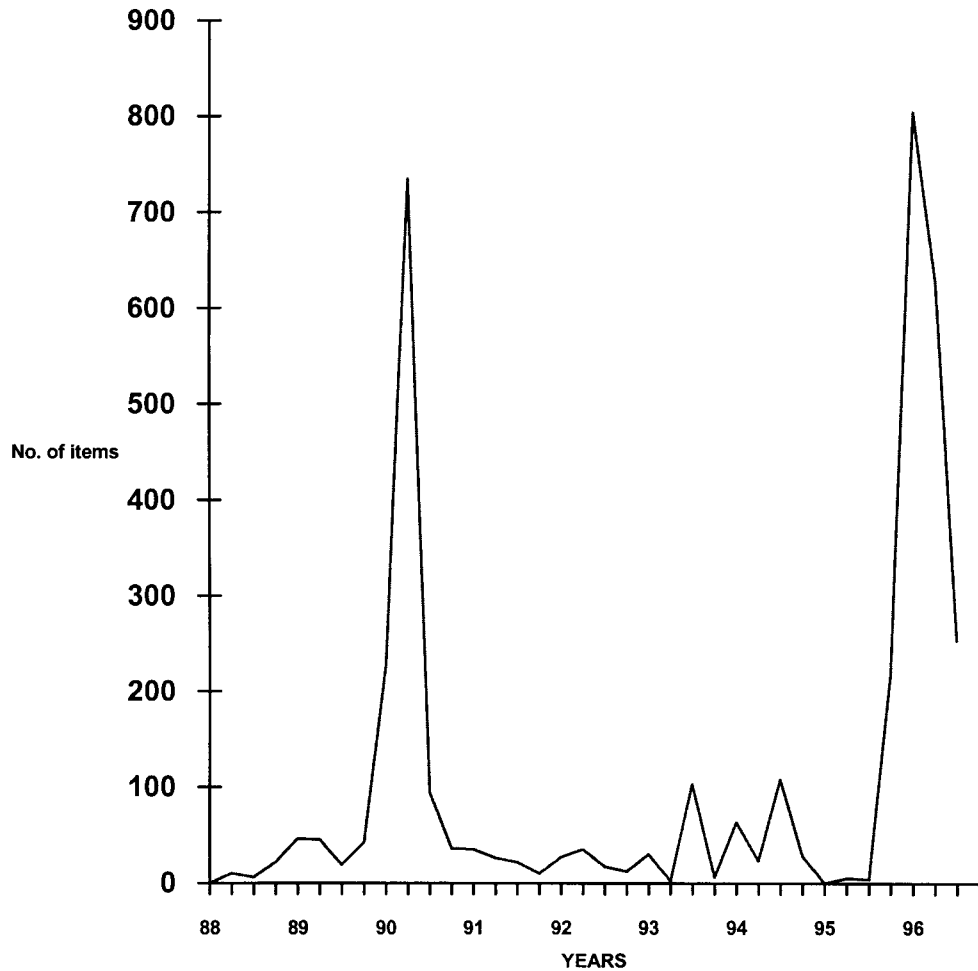


Fig. 1. British national press coverage of BSE 1988–1996.

will happen there? You can't do that. They will then, I would guess, take the worst possible line¹⁰.

Witness also the 'translation' into popular idiom of the science of BSE. According to the chair of SEAC, the government's expert committee, Professor John Pattison: "In any common usage of the word, beef is safe". However, in scientific uses they would only say 'as far as we know'. Similarly, even non-governmental scientists apparently oppose the idea of public or media access to scientific data on grounds that only those 'sufficiently sophisticated' will interpret its significance 'responsibly' (*Nature*, 1996b). It has been pointed out elsewhere that such an approach assumes an irrational, naive public and in fact is likely to have the opposite effect intended by officials in promoting

public scepticism (Wynne, 1996a). It is also worth observing that such an approach is profoundly antidemocratic in its desire to reserve judgement to the 'experts' and keep information from the public and the media. Calculations about the media — at least — influence the way in which things are said and can — at worst — engage scientists, advisors and politicians in misinformation.

BSE became a significant public issue on two occasions (see Fig. 1). First when it became clear that transmissible spongiform encephalopathies (TSEs) could jump the species barrier, when 'Max' the cat was revealed to be infected in May 1990. Media coverage declined again in June 1990 as the media became interested in other stories and the European decision on beef certification for BSE free herds was passed. Interest picked up again in late 1995 with increasing numbers of CJD cases and peaked in March 1996 when the government stated that BSE was the 'most

¹⁰ Interview with the author, February 1994.

likely' cause of new variant CJD. In 1990 the media framed the problem as a potential but uncertain risk to human health, but the policy framing of it as a veterinary issue continued. Given what happened in 1996 the peak of interest in 1990 is best seen as a *failed* attempt to change the public *and* policy definitions of the problem to one of risk to human health. The safety measures which were put in place from 1989 were not treated seriously in MAFF who simply used them as a public relations device to ward off public and media interest and pressure. It can be said that this approach although doomed in the end (in 1996) was quite successful for a time. In 1996 the struggle between the vet medicine and human health approaches took a decisive turn with the linking of BSE and CJD by the government's Spongiform Encephalopathy Advisory Committee (SEAC). In 1996 health interests seem to have become dominant for the first time. Unsurprisingly this led to the greatest media attention which BSE had ever had (and in the absence of a major CJD epidemic probably will ever have). However, the direction in which the media debate moved was to quite quickly bury health concerns and the key (media) issue became the European ban and the government campaign against it. Here the health issues were quite quickly submerged by key sources in the policy/political community which concentrated on blaming European self-interest, public hysteria and media sensationalism. Partly as a result of this (speaking very generally) British public scepticism of beef was turned around (on public responses see Reilly, 1999). Public health interests did however retain significant power in the British policy community and remained dominant in the European arena.

When an issue like BSE becomes a significant public controversy, one obvious result is that the media seek out comment. This can have the effect of seriously reorganising time budgets for scientists, civil servants, politicians and others. Indeed it has been suggested that in the case of BSE "some scientists have had virtually to disconnect themselves from the press to pursue their research effectively" (*Nature*, 1996c). However, the shape and scope of public issues can also affect the research questions which are asked, the funding available and the perceived value of research among peers, decision makers, funding agencies and the public. Close involvement with the media can even alter the nature of research which is carried out¹¹. Stephen Dealler recounts his involvement in the making of an edition of *World in Action* transmitted in November 1995 which demonstrated that large numbers of infected cows were still entering the food chain.

The preparations for this programme involved carrying out a number of tests which would not otherwise have been done and discussions with *World in Action* about how the science could best be presented (Dealler, 1996).

The media can improve or harm a scientist's standing among their peers and otherwise help or hinder research projects. Typically, those who operate within the ambit of official (government or corporate) science have most to gain and those outside the ambit most to lose (papers unpublished, research grants refused, jobs lost and reputations destroyed). We can see elements of this in the BSE saga, but we can also see the loss of credibility for the official scientist, especially when official wisdom either turns out to be wrong or is hastily revised. Similarly, dissidents can gain enhanced credibility if they are acknowledged to have been correct. However, in general, scientists who need to appear on television are those without access to policy influence. In other words the media sometimes provide a 'last chance' for dissident views which can otherwise be excluded from the policy process.

The media can also be a means of highlighting a problem which is not being dealt with (or not properly dealt with) in the closed environs of Whitehall. Thus dissident 'experts' have found the media the only way to raise issues and influence government decision making (Dealler, 1996, p. 1):

for several years I have worked my way through the information on the subject and then fought to get the worrying data through to those people in the UK who were responsible for making the decisions. All the way I had been told that this approach would not work and that the only way to get anything done was through the media.

Launching new data into the public arena sometimes creates unstoppable pressure on government departments: for example, policies on abattoir regulation and offal in baby food have been hastened by exposure in the media. In the case of abattoir regulation the Institute of Environmental Health Officers was instrumental in bringing data on abattoir practices to the attention of MAFF. However, the ministry failed to reply to the Institute's correspondence. It was only when the media were approached some years later that something was done. As one member of the Institute put it (cited in Reilly and Miller, 1997, p. 247):

We approached several journalists and said 'Look we've found that there are some disgracefully risky things going on in abattoirs and something has to be done about it' the good ones... agreed... With government it is necessary to get the ball rolling,

¹¹ For equivalent processes as they affect social science see Adler, 1984; Rosen, 1994.

everything takes such a long time. However, if there is public concern that can move things along

Finally, the media can markedly influence public belief and behaviour about risk. In the case of BSE, consumption of beef and beef products dropped dramatically in both 1990 and 1996 (by around 28% (for household purchases) in 1990 and 40% (for the market as a whole) in 1996 in the immediate aftermath). By the end of 1996 the market was still 16% down (Information from letter to the author from the Meat and Livestock Commission (21 May 1993); Meat and Livestock Commission, 1997). This of itself has policy implications since farmers' representatives and government policy makers have to respond. In the event their key aim has been to 'restore confidence' in beef, a policy which as government ministers point out is not based on the 'best scientific advice'. Nevertheless, science continued to be recruited by the British government to claim that there was no basis for the European beef ban and that it was the result of European self-interest, public hysteria and media misinformation (cf. Nowotny, 1981).

The media are crucial to social actors' assumptions about what is possible or desirable, to the responses of the public and policy makers, to the planning of the promotional strategies of groups and individuals. It is misleading to make fundamental distinctions between scientific reality and public perceptions (as some natural and social scientists, policy makers and journalists do (see Miller, 1998b)) as if the biological reality of BSE came first and everything else afterwards. The dramatic decline in beef sales shows forcefully the real consequences of definitional struggles in the framing of public debate. Thus an understanding of the real basis of BSE as a public issue needs to look much wider than the specifics of causative agents at the social production of risk. As Molotch et al. (1987, p. 45) put it "because [the media and policy makers] so continuously anticipate each others' moves, their activities are, as a matter of course, mutually constituted" (their emphasis).

One of the key roles of the media in the BSE crisis was to highlight the inadequacies and undemocratic nature of the policy process and prompt further government action. However, it would be a mistake simply to conceptualise the role of the media as encouraging open debate and democratic participation. There are many instances where media attention has legitimated antidemocratic policy options or constrained policy makers from making even modest reforms (Miller et al., 1998) and the media operate in the way that they do in pursuit of their own specific interests. Equally there are many issues which have serious consequences for human health or democratic participation which are not picked up by the media and fail to be come

risk controversies when their 'objective' severity might merit it.

Policy and the media

Clearly the relationship between science and policy is complex and cannot be reduced to a simple 'informing policy' model. Furthermore, research priorities and findings as well as policy outcomes are the result of negotiation, contest and struggle and not the result of a rational selection between alternatives. Thus, accounts of controversy which emphasise the functional 'filtering' (e.g. Mazur, 1987) of issues are limited. Similarly, those which recommend the separation of disputes resolvable by more 'facts' from those where 'arbitrary standards of safety' are appropriate (Engelhardt and Caplan, 1987, p. 23), fail to capture the actual dynamics of definitional struggle and decision making.

Much of the process of deliberation by and conflict between, scientists and policy makers is informed by assumptions about the social world and how it works (how many farmers will comply?, how will the public react?, will the media interpret it in a particular way? what will ministers or civil servants accept?). This is an area where social science can help to understand both the policy process as it is and how it could be. Yet, social science perspectives tend to play little part in these debates.

Some policy issues can be largely confined to a small group of actors in a tight knit policy community with little input from wider forces or interests. This is most likely when the matter concerned does not become a 'public issue' (i.e. it does not arouse sustained and significant interest from the media whether as a result of government action, conflict within Westminster and Whitehall or as a result of pressure from below (pressure group activity, public concern etc.)). Of course some policy areas can rise and fall on the public agenda. In the case of BSE, its appearance as a major public issue also featured the heaviest policy traffic. The emergence of public issues are one of the key ways in which media institutions can set the agenda for policy makers even if the only policy aim is to remove the issue from the headlines. Two key ways in which this happens is if the issue is *seen* as being resolved or dealt with or if media attention is dissipated and/or switched elsewhere (Miller and Reilly, 1995). When BSE declined on the media agenda (in June 1990, for example) the policy process could move back towards the closed and secretive model often preferred by policy makers and politicians reemerging only fitfully in the years before the fully-fledged re-entry to the public agenda in March 1996. A key conclusion, therefore, is that there is no such thing as a general policy process or a general model of agricul-

tural policy, since the policy process can and does change depending on the varying relationships between the public, the media, interest groups and policy actors. This has implications for those approaches in political science which stress either process or outcomes. Methodologically process needs to be examined not only for what it can tell us about technical procedures, but what it can tell us about power, influence and struggle. Of course, as Greenaway et al. (1992) state, questions of outcomes are also important in this respect, but both approaches need to be sufficiently sensitive to the way in which issues come to be defined as important in the public domain and the way in which key issues can be kept off the public agenda.

The risk society, science and policy

The treatment of definitional struggle in risk theory is also limited. We can take the example of Giddens' attempts to theorise the emergence and consequences of modernity, which operate at a high level of generality and abstraction. It has been suggested, that given the level of abstraction, it would be unfair and misconceived to attempt to test his writing since it is not intended for use in pursuing empirical research (Gregson, 1989, pp. 246–247). However, Giddens (1989, p. 296) explicitly denies such a charge and claims that his theory of structuration provides 'concepts relevant' to empirical work. Taken with the fact that Giddens does make propositional statements, which are capable of being falsified, it seems appropriate to submit some of these to empirical investigation.

Giddens himself suggests that BSE is evidence that there is increased uncertainty in the contemporary period (cited in Lloyd, 1997, p. 18)

There is a new period of risk in which it is very hard to calculate the nature of the risk. There are no historical parallels. Insurance companies know when you get into your car what the average risk is that you will end your journey. However, now that's not true. We don't know what is the risk of BSE. We don't know what the risk is of new products... It is not that the world is more risky than it used to be: it is that the nature of the risk is harder to calculate.

This account overplays the difficulty of contemporary risk assessment and the inevitability of risk. It simultaneously underplays the uncertainty of the past and historical advances in knowledge and the social production of risk.

Let us acknowledge that there is uncertainty about the science of BSE. The identification of the infective agent, the testing of the prion theory, the specification

of the precise route of transmission to humans and the likely extent of risk of CJD all remain sources of some scientific uncertainty and controversy. However, there are some things that we can say about BSE, such as the widespread agreement that its development was facilitated by the twin tendencies of the industrialisation of agriculture and the rush for profit ushered in by the Thatcher regime in 1979. Of course, these are matters of politics and economics as well as of science. It is an analysis of the political, economic and cultural aspects which can suggest solutions to a problem like BSE as much as, if not more than, an analysis of the science of BSE. The uncertainties of the prion theory or other aspects of scientific uncertainty on TSEs are not the most or only important ones which might or should determine policy decisions. To imagine that they might is, as Wynne (1996b) has pointed out, to collude with the rhetoric of some aspects of natural science. It also colludes with the policy position maintained by the British government that nothing could be done until there was more certainty. The political uses of 'ignorance' are manifold (Stocking and Holstein, 1993), but they should not intrude on social scientific accounts of the world. Emphasising uncertainty around BSE implies that we do not know how BSE emerged or the social, cultural and economic factors which underpinned its emergence. It can also lead to the conclusion that nothing can be done about uncertainty, that contemporary risks are out of control. This is quite misleading since different policy options were possible in the 1970s and 1980s (both of which could have prevented BSE or minimised its impact) and some are available now.

Giddens' comparison of BSE with insurance assessments of the risks of cars is also misleading. The 'knowledge' of the average risk of car journeys did not always exist. When the first car crashed, the risks of a crash were, we might say, uncertain. However, we now know more about car crashes. Insurance companies are able to calculate probabilities partly because there have been more than enough crashes for statistical methods to work. Similarly with BSE 'knowledge' about the statistical likelihood of contracting CJD will increase as more cases do or do not develop.

More fundamentally, we can ask what sort of knowledge we gain from such methods. Insurance calculations are more or less sophisticatedly decided by the analysis of crude positivist categories (based on, for example, postcode, size of car, gender, etc.). These presumably 'work' for insurance companies in promoting profit, but this is no reason for us to regard them as reliable or certain knowledge. For example such methods tell us little about why cars have become so important in our society nor about the wider questions raised by dependency on 'car culture'. Giddens' comparison neglects the processes by which risk is socially

produced, transformed and redistributed. This is a process in which science often plays a part, but it is not necessarily a crucial part either in terms of understanding why a phenomena has occurred (death on the roads, BSE) or what should be done about it. For that we need a broader analysis of society than can be given by specialist risk assessment procedures.

Giddens presents a picture of a past in which science continually progressed bringing health benefits for all (1991, pp. 114–116). Yet suddenly when we come to ‘late’ modernity there is more uncertainty in science. That this has happened is a propositional claim to be examined and clearly we might want to point to increasing specialisation in particular branches of science. However, Giddens does not do this. He is content to list the improvements in health of a past era while implying that such advances are now less possible because science is uncertain. This simultaneously denies the intrinsic uncertainty of past science and promotes the unknowability of the present. However it also attributes advances in the health status of the population too narrowly to advances in science and medicine. Once again a broader analysis is needed if we are to understand the social production, distribution and decline of specific risks. Take the example of tuberculosis. By the time chemical therapy was introduced 90% of the decline in the death rate had already occurred as a consequence of better nutrition brought about by the advance of working people. So rather than attribute the ending of TB to developments in modern scientific medicine, “we are much closer to the truth when we say that it was the conditions of unregulated nineteenth century competitive capitalism, unmodulated by the demands of labor unions and the state, that was the cause of tuberculosis” (Lewontin, 1993, p. 45). Such an approach puts quite a different gloss on uncertainties about the emergence of BSE.

BSE is not a product of technological developments or processes of globalisation or the inevitable concomitant of high modernity. To hold this view also implies that there is no better way to deal with problems than how they have in practice been dealt with. Indeed, as Gregson argues, one of the key problems of Giddens writing in this area is that it forecloses any “notion of possible alternatives” (Gregson, 1989, p. 248). It also implies that the BSE (as a disease and a public issue) did not occur because of determinate actions of determinate people and institutions which can (in principle) be uncovered by empirical research. Ironically, then we find that a sociologist heavily preoccupied with the relations of agency to structure is unable to find a place for agency in his theoretical schema, partly because to do so would mean having to ‘touch ground’ with the empirical (Gregson, 1989, p. 241). Similar criticisms about agency can be made about Beck’s concept of the risk society (O’Malley, 1997).

In conclusion, Giddens’ work overemphasises the uncertainties of the contemporary period and idealises the past as a period of greater certainty. His presentation of the present as an inevitable consequence of modernity does not match the empirical evidence in relation to BSE. The lack of contact with the empirical and the consequent inability to present “possible alternatives” (Gregson, 1989, p. 248) leaves his writings in this area vulnerable to the charges against ‘grand theory’ set out by C. Wright Mills (1959), p. 33) 40 years ago:

The basic cause of grand theory is the initial choice of a level of thinking so general that its practitioners cannot logically get down to observation... One resulting characteristic is a seemingly arbitrary and certainly endless elaboration of distinctions, which neither enlarge our understanding nor make our experience more sensible. This in turn is revealed as a partially organised abdication of the effort to describe and explain human conduct.

Risk, definition and determination: concluding comments

Perhaps the uncertainties attendant on scientific endeavours have been overplayed (cf. Nelkin, 1987; Wynne 1996a,b). Certainly in the case of BSE, much of the relationship between science advisers and civil servants/politicians bore more relationship to shaping science rather than responding to its uncertainty. If the science had not been manipulated and BSE had been regarded as a public health issue, then quite different funding priorities and policy decisions would have been taken. This is not to say that the science would have been free of value commitments. Clearly, defining the issue in terms of public health is fundamentally a value question. However, it does mean that the science can more easily investigate a range of questions about human consequences which were effectively ruled out by the alternative definition. And, if we are interested in human health, it is an approach which is likely to get us closer to the truth about the transmission of CJD. This would also allow the adoption of policies which have more chance of working to avert cases of CJD. This may be the case even if the type of science deployed is dyed in the wool positivist and concentrates only on the immediate biological causes of CJD and not their social production.

However, assessing the social production of risk is rejected by some theorists as overly realist. Questions regarding the truth value of scientific propositions are dismissed as a ‘realist distraction’ by Lash and Wynne (1992, p. 5). Wynne’s work concentrates on the contingent nature of scientific knowledge and he draws a

series of contrasts between expert and lay assumptions and knowledge. The ‘key’ (Wynne, 1996a, p. 13) to understanding science is not that it is corrupted, or manipulated or lied about, but that science itself is limited. Wynne argues that this is related to the particular epistemologies and discourses of particular types of science. These are exhorted to become reflexive and negotiate with other ways of examining the world, which would entail the development of the social or moral identities of the actors involved rather than a greater truth value (Lash and Wynne, 1992, p. 5). Yet at the very least the privileging of the contingency of science as an explanation directs our attention away from the political and economic context in which scientists actually work and which also contribute to the specific ways in which science is communicated. It seems to me that attention to this area, in addition to the contingency of scientific knowledge gives a more adequate picture of the involvement of science in politics. Not to do so risks writing of science as if it were just a specialised discourse or epistemology which is fundamentally separate from other epistemologies or ways of knowing the world. In some respects this colludes with the scientific version of events in that it separates science from other forms of knowledge (something which Wynne (1996b) criticises elsewhere). If however, we see science as deeply implicated in politics and we see manipulation (of research agendas, funding, findings etc.) promotion, secrecy, etc. as constitutive of science, then science is much less a matter of separate discourses and much more a matter of politics. By relatively neglecting the politics of science, Wynne is able to treat these problems as problems of interdiscursive reflexivity and to avoid the question of truth value (elsewhere he talks of the “historical experience of secrecy and misinformation” (Wynne, 1996b, p. 65), is this really misinformation or only a discursive construct?).

The present argument does not follow versions of the social constructionist approach (either in work on ‘social problems’, the sociology of science or elsewhere (see Abraham, 1995 for a wide ranging critique) that risk controversies are simply or primarily discursively constituted (cf. Adams, 1995; Miller and Reilly, 1995; Soper, 1995). Nor is it accepted that the existence of contest makes it impossible to judge either the ‘best’ course of action under uncertainty or even the ‘truth’ of the matter. The profile of risks in the media and in public debate does not and should not necessarily mirror their objective severity. That is, risks are represented according to the outcome of promotional strategies and their negotiations with the media, but, in practice, reality imposes some limits on what can be convincingly argued. For example the cases of CJD in young people finally discredited the animal health approach to BSE. Furthermore, policy decisions, con-

sumer preference and social science theories are capable of and should be disciplined by the evidence. It is sometimes possible to decide between theories on the basis of the evidence. It is also possible to decide between competing policy options in the face of uncertainty, notwithstanding the complexities and pressures brought about by technological developments which both create and measure risk. Such pressures are themselves brought about by determinate social forces. Nelkin points to ‘an increasing tendency to reduce humans and nature to resources’ (1992, p. xii). This tendency is part of the collapse of constraints on the market and the relentless opening up of new markets by capitalism in Britain and the US in recent times. This has been especially true of the areas of biology, agriculture and genetics, where scientists are increasingly becoming entrepreneurs and chief executives of what were once publicly funded research centres. These are all determinate processes which have been facilitated by political decision making (or the absence of decision making) and in which alternatives have always been available. They are not an inevitable consequence of processes of modernisation, reflexive or otherwise. The rapid development of market relations in science is itself a central reason why specific technological developments have taken place in Western societies. Put like this the ‘forward’(?) march of technology is less an intrinsic part of high modernity than the outcome of determinate decisions in the regulation of the market.

We cannot escape from the conclusion that risk controversies are in the end also political and social conflicts. The political system has long-since capitalised on the resource provided by scientific risk assessment and, as Nowotny (1981, p. 235) has put it:

is using it to an increasing degree for legitimising its decisions, incorporating scientific authority in subtle ways. Public controversies on the impact of scientific–technological developments... utilise scientific expertise as an instrument to carry out a conflict which is fought over social and political objectives and means to reach them.

Solutions to this problem do not therefore lie in educating scientists to be more reflexive or politicians and policy makers to have more ‘accurate’ understandings of the social world. To imagine this might be the case ignores the fundamental problem that many risk disputes are not amenable to ‘rational’ solutions in that they are disputes over matters of interests and the distribution of resources. Crucially, therefore, much of what passes for official wisdom and scientific assessments are not just inadequate or ill-informed. We also need to understand that there is deliberate misinformation and, most fundamentally, that ideology is the cru-

cial attendant of such controversies. That is, the beliefs and statements of certain actors are a heady and varying combination of deception and perspectives which are functional for the interests of the powerful in science, politics and decision-making. One key consequence of this is that empirical research should examine the contribution of scientific indeterminacy *as well as* the role of misinformation and deception in risk controversies. Not to do so leaves us unable to understand their real dynamics and therefore to propose meaningful changes to the management of risk. Furthermore, approaching these processes by means of a detailed focus on the production of definitions can clarify the construction of expert, policy and media knowledge, while keeping hold of the links between such processes and the distribution and redistribution of power and resources.

“It is not”, as Raymond Williams put it “some unavoidable real world with its laws of economy and law of war, that is now blocking us”. And we might add, nor is it the risk society or high modernity or the increasing technologically produced climate of risk or even globalisation. “It is a set of identifiable processes of *real politik* and *force majeure*, of nameable agencies of power and capital, distraction and disinformation” (Williams, 1985, p. 268).

There is no apolitical way of extracting science advice, but there is a way of making assumptions explicit. There is no straightforward technical way of taking decisions, but there is a way of operating with transparency and without secrecy. There are no immutable laws of the market or of technological progress, but there are ways of making regulation work. We only have to make it so.

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