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'Opening Doors or Crossing Boundaries: Social science in the Policy Room

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Introduction

Sociology is often accused of sitting on an epistemological fence (which is of course analytically defensible when the sociological gaze does not favour a one-sided reading of the world). While fence-sitting is still an honourable epistemic tradition, sociology seems today to relish camping out, not on fences, but on 'boundaries'. An increasing number of contributions to STS engage in deconstructing boundaries[1]. This subverts discrete classification schema associated with current scientific discourse by creating or identifying new cross-boundary phenomena that have hybridity and heterogeneity (Latour), that are expressed as cyborgs (Haraway), complexities (Law and Mol, 2002), postmodern ontologies (Williams, 2003), the interpellation of the technical and the political (Barry, 2001), ethno-epistemic assemblages of lay and expert (Irwin and Michael, 2003), and so on.

Working across boundaries is also deployed to challenge dominant assumptions that shape the social ordering and application of science, especially by agencies of government. Some forms of ordering produce boundaries that have been seen to be limiting or even harmful [as in the critique of modernist notions of the boundaries of risk, Jasanoff, 2000]), or science policies may be criticised as constructing (perhaps unintentionally) barriers to a better deployment of our knowledge and understanding of the world (which may, for example, relate to the framing of innovation, and designer-user relations [Schot and Rip, 1996], or the role of lay or citizen expertise [Funtowicz and Ravetz, 1993; Wynne, 2002]).

Another boundary line relates to the boundaries of STS 'expertise' *itself*. Much of the boundary activity described above rests in a very central way on a de-constructivist methodology in which much (but not all) STS is anchored. This implies an unwillingness to privilege a particular reading of science and technology and associated knowledge claims, *when these are made by science itself*, not least because such pronouncements are as Latour (2004, p. 226) has argued, '*prematurely* naturalized objectified fact(s)' that seek to monopolise a particular version of the world. As a result, there has been a reluctance to embrace the idea that it is possible to make an STS-informed intervention 'for the good', since this would presume crossing some boundary lines and *occupying (though without formal residential status) the territory of science itself* – and thereby compromising the deconstructivist tradition of STS.

Yet the subscription to symmetry and deconstructivism doesn't, of course, have to leave things in pieces: increasingly, STS analysis is suggesting how science and its

[1] As indicated by the forthcoming special issue: John Law and Annemarie Mol (eds), special issue of *Society and Space*, on *Boundaries: Materialities, Difference and Continuities*, forthcoming 2005

technologies can be put together, reconstructed, in a more useful way (see Woodhouse, et al, 2002). For example, Notwotny et al. (2000) seek in their defence of a 'socially robust' science to use the insights of STS to establish the conditions on which 'reliable knowledge' might be fostered, a knowledge that is (and these are seen as mutually constitutive components) thereby not only more democratically but also more *technically* warranted (see also, Nowtony, 2003; Gibbons et al. 1995). In a similar fashion, Collins and Evans (2002) have argued for the development of a new STS model (a 'normative theory') of expertise and experience that seeks to define the basis on the technical contribution of scientists (and non-scientists) as experts can be acknowledged.

Wynne's recent call (2003) to catch science 'upstream' before its technological application occurs is a plea to make the *context of implication* kick-in sooner rather than later, to allow wider social values to shape the direction of science. Even Woolgar's deconstructive analysis of *accounts* of science and technology is turned into a means through which accounting is itself the topic for debate and thereby, a vehicle through which the, or at least *an, accountability* of science might be built (Woolgar, 2002).

Typically these diverse contributions focus our attention on the need for new knowledge spaces in which lay and expert might be brought together (see eg Liberatore and Funtowicz, 2003), where we treat 'amateur-experts' or connoisseurship seriously (Ellis and Waterton, 2005), where a 'civic epistemology' might be built (Jasanoff, 2002). This is seen as especially important in regard to 'difficult' areas of science and technology where decisions need to be made (such as over GMOs, MMR vaccines[2] etc). Accordingly, some suggest that new ways need to be found, new fora developed, to cope with the uncertainties and competing voices raised in debate.

For example, in genetics, as biomedical research and clinical practice become closer we see an increasing use of genetic screening and tests. As a result, many raise their voice in concern about new forms of 'social eugenics', whether from above by the state, or 'from below' through individual reproductive choice. It is clearly possible to problematise and deconstruct notions of 'predictive' tests provided by experts and reproductive choice, but this will not provide us with a vocabulary that will allow us to address the perceived social implications of this research, or develop a collective steerage through these difficult waters. And, while a 'civic epistemology' will probably be key to defining our eventual destination[3], it may not answer the more difficult navigational decisions we have to make along the way, nor, does it clarify the role of STS on the ship.

These interventions suggest how STS might act as something of an *intermediary*, as an agent working on the boundary between science and society, helping to set the terms on which science might be accorded a socially warranted status that in important ways is

[2] MMR stands for the UK's 'mumps, measles, and rubella' multiple (but delivered in one shot) vaccine given to babies, and which has been a site of controversy since claims of its association with a 'new variant' form of autism.

[3] Since, as Jasanoff (2003) says, it is this that provides 'the criteria by which members of that society systematically evaluate the validity of public knowledge.

distinct from and supersedes the conventional (scientistic) sense in which science has been legitimated.

However, I want to suggest that the moves towards a constructive deconstructionism still have a long way to go beyond the boundary itself, open the door and enter the space occupied by science and science policy. Those working in STS are painfully aware of this problem when asked to adopt the role of an expert in science as culture (or science-in-society) and are invited to deploy this expertise *alongside* other sciences. The problem is, scientists rarely regard their own practice *as culture*, so it becomes extremely difficult to secure a common ground. This is an increasingly common experience for those working in more applied areas of STS[4], not least because of the demands of funding agencies and their putatively interdisciplinary research agendas. To respond to these new demands STS has to try to open up a new space within which it and other discourses engage not in translation but dialogue and the development of a new vocabulary, a different form of social accounting for science. Crucially, at present, there is considerable asymmetry in this regard, where quite often the expertise of STS is seen as the midwife through which the reproduction and delivery of science can be secured in a more 'socially responsive and responsible' way.

The state and its agencies are, of course, happy to enrol STS and social science more widely to act as a medium through which science might be more effectively – i.e. politically – accepted and acceptable[5]. But the problem from the state's point of view is that planning for science becomes increasingly difficult where more science competes for limited resources, and where uncertainties over the contribution of science are seen to generate further risk: the social ordering of science becomes problematic and the conventional planning and prioritisation techniques of the modernist state become under increased pressure (Crook, 2000). As Bertilsson (2002) has argued:

> The abundance of risk- and science information creates at the same time knowledge deficits: it becomes increasingly difficult to translate the surplus of available science information into politically organised conduct' (p. 15).

It is then, not surprising that state agencies seek whatever resource they can – including a contribution from STS – to help sort things out, though somewhat ironic that that contribution might well work against any tidying up exercise. The problematic relation

[4] The 'constructive' application of STS analysis to science, technology and innovation has recently been debated at a conference in Oxford. The conference programme was primarily about the ways in which 'STS might make a difference' and on what basis does STS establish its 'utility'? See Coopmans, et al. (2004).

[5] The recent UK Government's forward look over the 2004-2014 period carries a chapter on 'Science and Society' in which we find the following:

The Government's goal is for the UK public to be confident about the governance, regulation and use of science and technology, by both government and business, to be positively engaged with science activity and feel that its views are valued. In order to achieve this goal, and to ensure that areas of research that could yield important quality of life and economic benefits are not held back, the Government's next steps in this field will be in two key areas: understanding, through careful monitoring, and then responding to, the population's developing concerns and expectations of science and technology; and working harder on horizon scanning to identify key upcoming developments in science and technology and any likely concerns surrounding them.

between the political and the scientific in terms of policy-making can be understood in a number of ways. Some have suggested that there is a 'gap' between science and its regulation, given the pace at which science changes (see eg Guston); others have argued, in contrast, that the uncertainty and provisionality of science mean that it cannot hope to keep up to the pace required for decision-making within politics (Collins and Evans, 2003). Perhaps both arguments are right, or address different levels of social ordering, the much deeper and slower world of regulation that sits beneath the shallower and here-and-now world of daily political debate.

In the rest of this paper I want to illustrate, through drawing on my own personal experience, some of the difficulties involved in crossing boundaries, in opening doors and occupying strange policy lands. I will argue that we can create new 'intervention spaces' for STS and non/STS dialogue that clarifies our role, and suggest in the end this might be seen as a 'sixth branch' within science governance. I want to do this through focusing on three forms of 'engagement' typical of STS research, each of which provides differing opportunities for (re-)constructive work. I shall call these:

- The characterisation and anticipation of emerging technoscience fields
- The exploitation of (future) technoscience
- The context of use of technoscience applications

I do not claim that these are the *only* sites for STS engagement, but they are the ones I have most familiarity with, and are certainly common to many others working in the field. I will illustrate each one of these through reference to my own experience over more than 20 years of work in science studies.

The examples below are emblematic of other cases I could cite and which are part of a long-standing ambition I have (personally, and since 1988 with my colleagues in my Unit, SATSU) to take sociology into science, not merely to deconstruct it but to see in what sense it is possible to use this understanding to shape science and science policy itself. As a result, like many others working in STS, many of my research grants have involved the interrogation of developments in science, such as in biotechnology or informatics, that in disturbing boundaries open up space for a sociological entry, not through a back or side window, but through the front door, as funding programmes relating to the 'impact' or implications of science and technology have appeared. These areas of technoscience are precisely those where new relations of nature, culture and technology – the inseparable nexus of what *makes* 'the real' – are cooked up and need as many 'cooks' as possible, not to spoil, but to make the broth, including, it seems, social scientists.

Stranger in strange land(s)

Let me turn then to discuss some of the areas into which my 'personal journey' has taken me, especially when crossing boundaries, and the lessons learned. This sounds a bit pretentious, akin to some sort of pilgrimage, but unlike the pilgrim, I wasn't going to any promised land or escaping from one, but going into a strange one, the world of what I shall simply call for want of a better phrase, 'applied science'.

Characterisation and anticipation of an emerging field

The first area relates to my early work on the UK's then foremost plant research lab, the Plant Breeding Institute (PBI) in Cambridge, where I spent over two years observing the work of and talking to the research scientists and their senior management, while also visiting a range of public and private organisations with which the PBI was linked. Learning the language of plant biotechnology was crucial if I wanted to understand what my respondents were saying and when they were saying anything of especial significance: this was key to retaining my ongoing access to and credibility among the scientists I spoke to. I developed a recipe knowledge of plant genetics, model systems, tissue culture, and the boundaries as well as collaboration between molecular geneticists and 'traditional' plant breeders, particularly in areas such as the disease resistance of crop varieties (Webster, 1989a; Webster, 1989b). My initial intent had been to examine the relationship between orthodox and the new genetic breeding techniques, to determine how 'hi-tech' science would engage with 'the art' of breeding in a strongly applied setting. While this was indeed retained as the primary focus of the study as a whole I also, with little choice, became increasingly involved in tracking the impact of the UK government policy of privatising and in effect thereby breaking up public research institutes. The PBI was on the government list and shortly after my study was completed was split up, with the 'applied' departments sold to Unilever and the rest relocated to the John Innes Institute at Norwich.

There is no time or space here to go into the details of this study or indeed what happened to the research groups subsequently, in itself an interesting story. What I want to do is make a general point about my work at the PBI in regard to crossing boundaries. This relates to how an engagement with a field can mean the STS researcher begins to become *a co-constructor of the field and to make certain knowledge claims about it as a field:* here, therefore, I want to draw attention to my first form of engagement, *the characterisation and anticipation of an emerging technoscience*. As the privatisation process kicked in, it was difficult not to get caught up in the broad sense of malaise and anger at the Thatcher government: PBI staff felt that the government misunderstood the area and failed to see the need to sustain rather than separate out the basic/applied programme. Not surprisingly, an STS approach had enabled me to characterise the work of the lab in a much richer sense than was provided by Lazards Merchant Bank, commissioned to undertake the private sale, and I could see that the heterogeneity of the area had actually strengthened the network of (research) relations (as Callon, 1987, might argue).

In my papers I argued that while there were tensions between the geneticists and the breeders, these were bridged through linked work they undertook in the PBI's tissue culture laboratory. The policy implication was clear: the way the government had

characterised the Institute's work was wrong and there would be serious problems for UK plant science in the future by the break-up of the lab and the knowledge-base on which it depended. I argued that eventually the different fields would need to be brought back together, as indeed happened (in both Unilever who bought the 'near-market' research programmes and the relocated Norwich group).

My (deconstructive) analysis of the field required proximity in order to secure a thorough grounding in what was going on in the PBI, yet also seemed to encourage the notion that I had a detailed understanding such that I knew what was 'good' for the field as a whole. I was also caught up in the controversy over the politicisation and commercialisation of the Institute and the perceived attack on 'public good' science. I argued that plant breeding in the UK needed a specific type of disciplinary and organisational structure if it were to remain innovative.

Clearly, such a claim could only be based on a reading of the cultural and organisational framework through which plant breeding had been both presented to and perceived by me: a different location – such as a different Institute - may well have generated a different account of the knowledge base and its imperatives. But this is perhaps only to be expected: within STS it is recognised that the relationship between science, technology and nature is multiple and multiply constructed through various practices, instruments, organisational arrangements (Law, 1994) and so on, and it is as Mol (2002) says always 'political'. My reading inevitably reflected this combination. It implied a sense of 'the field' that had some core elements that needed to be sustained, but clearly today, nearly 20 years on, 'the field' and its organisational and scientific practices have changed considerably.

This suggests that when we cross the boundary and move *into* the field we will inevitably become part of its combination and its politics, but our STS contribution is likely thereby to play only a small part in shaping the technoscience. If this is frustrating it is not surprising, and I think simply reflects my belief that we occupy a position that sits in the interstices of multiple dimensions of the field itself, and as such are not seen by those involved as *part* of it. *Co-construction* is then never a symmetrical process.

Exploitation of (future) technoscience

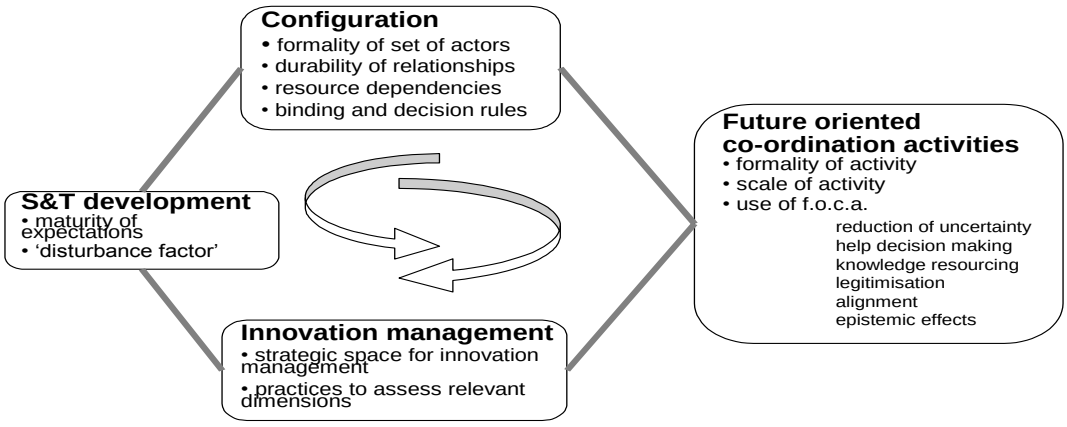
My second example of boundary crossing illustrates a different process at work. This concerns the role of STS researcher as critic of existing conventions and ways of thinking, a common role, of course, but when played within powerful corporate and policy circles and associated with the effective *exploitation* of science, usually means that advice about more appropriate ways of thinking is expected.

Foresight is the site I want to explore here (though I could have done something similar with IPR..etc). Foresight is an interesting area in science policy that combines Mode 1 & 2 elements inasmuch as it marshals current scientific evidence and a range of stakeholder views on which to build a picture of the potential technological paths that could be followed (and through which a 'roadmap' might be built) in a particular field. Currently

in the UK, the DTI's Foresight Programme is focusing on 'Brain Science', 'CyberTrust and crime prevention', the electromagnetic spectrum, and flood defences.

In the past few years I have collaborated with two research teams on STS science policy projects analysing the place and value of Foresight as a tool in managing knowledge and innovation. The FORMAKIN[6] project involved UK, Dutch and Spanish partnersl. The FOREN project involved eleven partners across Europe and sought to develop some guidelines for regional Foresight (now available on the web at http://foren.jrc.es/). I want to concentrate on FORMAKIN here.

How did we go about our task? In good deconstructivist mode we first sought to problematise the notion of 'Foresight' itself (see e.g. Webster, 2000). We argued that we needed to recognise that formal Foresight programmes needed to be located within a more useful category of what we called 'future-oriented coordination activities' (FOCA), that involved various forms of informal, codified, near, far term thinking about future needs, plans etc. The role of expectations as mobilisers of futures was also seen as key, as were the networks through which ideas might be developed. But we also saw this activity as only one of four key dimensions of a complex environment shaping technological innovation, which we represented in the following
diagram:

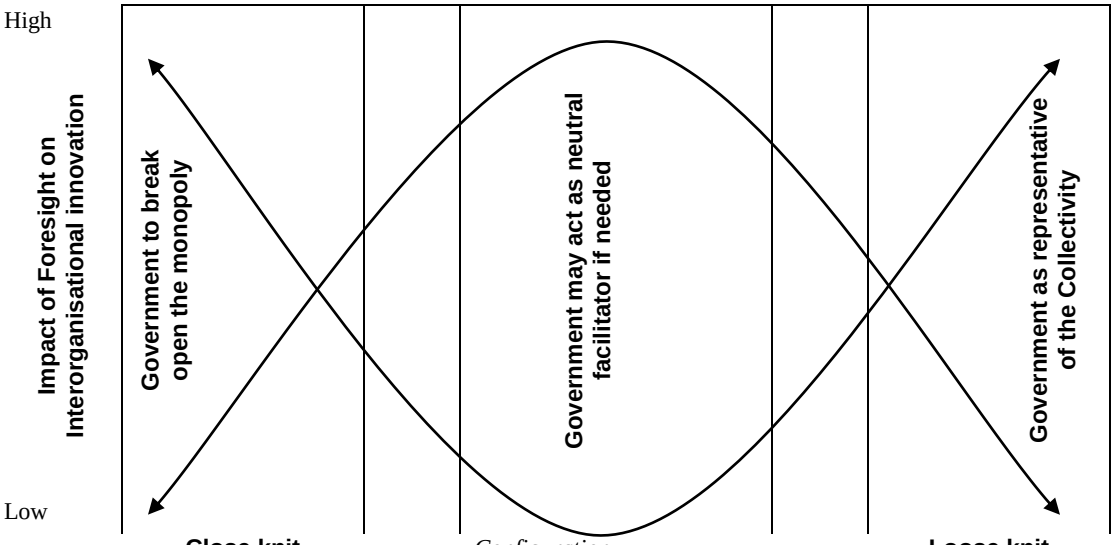


On the basis of detailed empirical analysis of different fields in health technology (an example of the *characterisation* process I discussed in my first paper) and further theoretical reflection, we produced a basic model through which we might be able to anticipate the likely role and utility of Foresight . This is reproduced below.

I do not want to spend time discussing this here, but simply to say that our claim was (and I guess still is!) that this model would help to identify in principle when Foresight might best be deployed at national or organisational levels within a science policy programme, and that as such it would contribute towards more effective knowledge management. However, while the model has an elegance and, at least on the surface, simplicity that has ensured that those in regional and

[6] See http://www.york.ac.uk/org/satsu/Projects/Formakin.htm

national government see it as a potentially useful tool, putting it into practice has been more difficult. I shall indicate why shortly. But first let me reflect on the opportunities for STS entry that this piece of work allowed.



Foresight can be a catalyst but will require force

Foresight likely to be much of the same

Foresight needs considerable effort to link actors and higher methods to cope with complexity

Formal Foresight serves as a catalyst to move configuration to the middle where actors can 'do it themselves'

Formal Foresight serves as a catalyst to move configuration to the middle where actors can 'do it themselves'

Method	**(positive/negative)**				
Panel	**neg**	**pos**	**pos**	**pos**	**neg**
Delphi	**neg**	**neg**	**pos**	**neg**	**neg**
Scenario	**pos**	**pos**	**pos**	**pos**	**pos**

First, it provided an opportunity to deploy well-established STS analytical tools (relating to expectations, networks, configurational relations etc) in a new way and thereby bring much greater depth and contextualisation to the meaning and place of f(F)oresight in innovation. Secondly, it helped answer the 'so what?' or 'what's in it for me?' question that Foresight practitioners often confronted, when trying to convince firms that Foresight

was a good thing. Many would reply that they were already engaged in future planning as a routine part of the business, or conversely, didn't have time for future planning, and any way, the scenarios were always far to remote from the more immediate priorities of the business. The model meant that, for many, this may well be true and Foresight would be redundant or inappropriate. This led to the third entry point into policy, that is, we offered ways in which it is possible to discriminate as to where and when to use it as well as showing how Foresight 'tools' (scenarios, consensus conferences etc) might well work *against* each other in some settings. This had not been considered before.

In short, deconstruction of Foresight had helped to build an analysis that could, in principle, enable a more effective reconstruction of the policy and its practice.

However, there were various constraints that made translation of this STS reconstruction more problematic than the 'simplicity' of the model might have suggested. First, the model would presume that a vital first step for any Foresight practitioner would be to characterise the field of interest and to do this each time, and that this would be nationally specific, such that one could not merely import experience from other countries even where the *same* technology was involved. Typically, Foresight exercises produce descriptions of technologies and their potential, not the specific ways in which they are or might be embedded in existing innovating trans-organisational networks. Secondly, one would also then have to characterise the networks found within the field which is a time consuming and expensive business, especially in emergent areas (such as telemedicine or embryonic stem cells) where hybrid and unstable networks are being built. Thirdly, once properly characterised, we argued that any interventions in loose or close-knit networks would require considerable policy investments at national and regional levels.

Clearly, what we had done here was to reconstruct Foresight from being primarily an enabling instrument through which a broad but abstract inclusivity was secured (via Delphi, consensus conferences etc) to a more selective and targeted policy instrument that was more about (re)configuring networks than about identifying particular technology options for all. Since technology options are only, from an STS perspective, possible as a result of quite specific 'congealed social relations ' (Grint and Woolgar, 1997), our approach to foresight would be to ask how such a 'congealing' of networks might be enabled in the future, or how existing overly congealed networks might be broken up.

The demands of a reconstructive STS sketched out here may mean that at least at national government level, Foresight is best seen as a discursive framing of possible futures, and that its value lies primarily in the actual consultation process through which such discourses are produced, and that our attempts to take things further would be asking too much. However, without these next steps, it seems that Foresight programmes at a national level will be difficult to translate into whatever policy niches are available down on the ground. While Foresight remains at this broad level it also becomes difficult to evaluate: I myself have often hear those at regional level asking what impact Foresight has had or might have and how could this be evaluated anyway? There appear no specific metrics one might use.

Context of use
The third arena where we can see an opportunity for (re-)constructive STS engagement relates to the *context of use* of technoscience.

There is one example I want to draw on here, which relates to a document[7], 'Commentary on the DoH White Paper', I prepared on behalf of the ESRC/MRC Innovative Health Technologies[8] research programme in response to the UK government's new Department of Health policy on genetics in health care. How was this discourse constructed and why, what problems are there in mobilising STS through such a route and why? What are the boundaries that are crossed, and can you 'get back'?

The critique was built through consultation with a number of projects funding through the IHT Programme that have a particular interest in genetics. They responded to a draft I prepared that commented on three areas that figured prominently in the White Paper. These were:

- the general context within which genetics is developed
- specific issues relating to the main science-based areas covered in the Paper, viz. screening and diagnostic testing, gene therapy and pharmacogenetics
- public engagement with genetics.

Space limitations prevent me from discussing all these issues, so I will focus only on the second of these, for this concentrated on the context of use of genetics technologies, and within this the matter of screening and diagnostic tests. In terms of screening for childhood disorders, the way that maternity care is organised in the UK is currently designed to process a large number of women as efficiently as possible through a 'default' pathway. This results in many decisions being routinised and thus non-problematised. It also raises the question of the meaning of 'informed consent' being tantamount to 'informed compliance' in different contexts, from home birth to screening, to choice of care provider and subsequent interventions. Thus the problem is not just about training or indeed on-going training of midwives and doctors, but around the social and organisational context within which maternity care is provided.

In regard to genetic tests, the programme has various projects exploring this in detail and could offer advice on their deployment in different contexts. For example, susceptibility or predispositional tests are increasingly common across the NHS. In this regard, in a study of breast cancer genetics clinics, IHT research shows that while decision support technologies can assist clinical decision making, these will be interpreted and modified such that levels of risk (high, moderate, low) are locally determined according to experience, circumstance and case. In other words, as genetic testing is rolled out through the NHS, careful consideration will need to be given to the balance between national instruments and measures, the quality of life assumptions that inform them, and

[7] Available as a report on www.york.ac.uk/res/iht
[8] See www.york.ac.uk/res/iht

their local interpretation. This will be an important issue for the health Trusts at regional level who have been invited to take the lead on implementation.

This commentary on the genetics White Paper indicate the value of STS in emphasising the diversity and context of use as key to understanding what makes technoscience *'workable'* and mobile (or not) across different settings and networks. This emphasis ensures that the principal message from an STS perspective about context is what is socio-technically *feasible*. This is a point I will return to in my concluding remarks. There are, however, serious difficulties in getting this message picked up since there are quite different senses of the importance of context as one moves from STS to non-STS discourse. So, for example, in the case of genetics implementation, for the geneticist and health policy actor, 'context' tends to be defined in terms of the appropriate use of diagnostic and treatment algorithms for different patients, whereas, from an STS perspective context is seen to refer to the way actors will co-construct the utility and value of a diagnosis and/or treatment. It is not easy to translate across these two very different approaches in any simple way, but this is worth trying.

This completes my discussion of the three arenas that I believe provide excellent opportunities for (re-)constructive STS work. Within the Innovative Health Technologies Programme and elsewhere we can find examples of recently completed or current research that is exemplifies this type of work: work on xenotransplantation (Brown and Michael, 2003) and pharmacogenetics (Webster *et al*, 2004) involves attempts to characterise and anticipate emerging technoscience fields; work on genomics (Nightingale and Martin, 2004) provides a critical examination of the claims made about the future payoff from genomics; Wood et al. (2003) and May *et al.* (2002; 2003) offer extremely valuable analyses of the contexts of use of genetics testing and telemedicine respectively, providing important insights into how these systems might be made both more useable and more accountable.

Concluding discussion

To recap my argument, I have suggested that the three forms of boundary deconstruction most commonly found in STS work have in turn led to, and in many ways enabled and demanded, contributions from within the field that offer ways forward in regard to a reconstruction of science/society relations. Much of this has focused on reconfiguring lay-expert relations accompanied by the democratisation of the prioritisation and practice of science. While extremely valuable, I argued that we should take things further and explore the boundary of STS itself and its direct engagement with science and technology, and science and technology researchers, and thereby with science policy.

I argued that there are three forms of 'engagement' typical of STS research, each of which provides differing opportunities for opening doors and (re-)constructive work, and gave brief illustrations of each from my own research experiences in SATSU over the past 20 years. In each case I indicated what the 'pay-off' from this engagement might be

with regard to the particular area under consideration and some of the problems that arise when moving into this territory.

I want to conclude by suggesting that in my experience one of the more successful ways in which STS engagement occurs, as a general principle, is where the STS/ non-STS nexus is brought together by sharing a similar *methodological* problem – such as in new research I am about to begin on stem cells where my interest lies in how quality standards for stem cell lines are constructed in the future, which is precisely the same question those directly involved in stem cell research would like to answer. Two of my three forms of engagement are likely to figure more strongly in this research: the characterisation and anticipation work, and the context of use work.

This notion of sharing a problem that can be translated across the STS/non-STS nexus seems to me what Berg *et al.* (2004) have most eloquently discussed in their paper on the construction and use of performance indicators (PIs) in Dutch Hospitals. They have been commissioned to rebuild these PIs and have done so precisely by asking what 'problem' were they supposed to address and what makes sense in terms of a *feasible* way forward to which actors could subscribe and which thereby enabled interpretive flexibility. They say:

'[O]ur 'feasibility first' philosophy emphasized that our aim was to start a *process* of self-improvement, of increased attention to accountability and the legitimacy of the public's question for transparency. It was not a 'ranking' we were after, nor an attempt to provide a flawless and transparent map of the hospital landscape. Such an attempt could only have invoked debates about the accuracy of map, and the injustice of some of the representational techniques selected. Rather, we opted for a *deliberately* rough and multi-interpretable map, leaving the hospitals free to add explanatory markings and legenda, and work from there. From such a map, no simple overall rankings could be made, but many more or less interpretative comparisons between individual hospitals or scores would be possible' (p. 15).

What seems key here is an attention to context of use of PIs, a deconstruction of the surveillance and a reconstruction of the enabling aspects (to make 'interpretative comparisons between individual hospitals') of PIs through a close STS analysis of their inscriptions and performativity. This was an analysis that the non-STS actors could embrace. It also reminds me of Jasanoff's (2002) call for 'technologies of humility', methods that deal with and help us understand the 'uncertain, the ambiguous and the uncontrollable'.

My broad argument seems also to me to lend support for Collins and Evans' (2003) notion of 'interactional expertise': that is, while STS analysis can never be *of* the science it engages with it can offer an informed and mediated commentary and critique of it through its embedding in the field – 'a specific level of technical expertise within a specific technical specialism' (p.448) – and thereby credible interaction with non-STS actors.

These suggestions could, I believe form the basis of a core range of activities for a 'sixth branch' of STS work (Jasanoff, 1990) that the community might develop in a more systematic way when crossing the boundary into science policy. Such a branch would position itself as 'serviceable STS' in the sense that it itself was aware of its own context of production and limitations but thereby the more robust for engaging with policy.

At the same time, we cannot simply become a branch of policy: independent STS critique, not least of the economic and political interests informing policy options must be the *first* priority for the field. We need also to be realistic about the warmth with which our reconstructive STS is greeted: as Halffman and Hoppe (op cit) note, there are often powerful disincentives working against it:

> One reason is the lingering fear of making visible some of the contingent aspects of the construction of expertise, hence undermining credibility of expert advice. There are bureaucratic survival issues also. Even the suggestion of a negative evaluation report can have severe consequences for the continuation of advisory institutes, especially if their legitimacy was not entirely solid or in times of budget cuts (p.9).

STS is ultimately rooted in sociology. As such it needs to define its object of analysis as science within the social. How it does this is open to debate. Burawoy (2004), President of the ASA has called for a public sociology expressed through a critical, reflexive knowledge rooted in support for 'civil society'. This may be a good idea in theory but what it means in practice in the policy domain is less clear. When we get close to the policy domain, as in the boundary crossing discussed here, the ways in which we operationalise our commitment to 'civil society' need to be constantly rehearsed. In the case of the GM Nation? debate for example, I often thought that both from the perspective of better policy making *and* the interests of 'civil society', the debate should never have been about GM technology *per se*, but more about the location of this within the wider socio-technical system we call British farming. This would have, I believe, been the basis for producing a serviceable STS. This would also have been a more 'serviceable' policy for it would anchor policy-making in the social, and open up policy to more diverse modes of reasoning and disclosure of evidence. As Jasanoff has said elsewhere, (Jasanoff, 2004), the state needs to recognise that science and policy making are two arenas that are not 'cognitively and culturally distinct' but 'engaged in processes of constant exchange and mutual stabilization'. We need to challenge the process of purification (Latour, 1993) associated with the state that separates out what is deemed to be science and what 'political'. That this stabilisation through a move away from purification can be better informed by an STS reconstructive expertise is what I argue we should be trying to achieve.

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