

• ABSTRACT

Is postmodernism debilitating for feminists approaching science? Is the actor-network approach, which rejects dualisms and universalism, politically impotent? Or is such a critique epistemologically conservative? I explore these questions by drawing on empirical research examining the UK Cervical Screening Programme (CSP). Specifically, I attempt to answer the question of whether or not women should participate in the CSP and undertake a cervical smear test. Because the CSP is constantly changing as participants' identities multiply in negotiation, I propose that there is no stable point from which a single decision about lay participation can be made, however politically useful it may be to do so. I demonstrate my discomfort with talking about whether women should or should not participate. Given the dynamic nature of the Programme, a 'should' discourse is inappropriate, and can also be guilt-inducing and oppressive to women. My preference is for a discourse which emphasizes that women could participate.

Feminism, Sociology of Scientific Knowledge and Postmodernism: Politics, Theory and Me

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Current postmodern social theory rejects essentialism, contextualizes (and refuses to universalize) knowledge-claims, and acknowledges the heterogeneity of identities. Within this macro theoretical climate, some of us approaching science from a feminist perspective are facing a dilemma: we have to try to balance these theoretical commitments with a political and moral commitment to non-oppressive values, to ensuring a voice for women and to highlighting women's oppression. That is, the relationship between feminism and postmodernism (as diverse as they both are) often seems to be characterized by an ambivalence that can cause discomfort.¹ Some feminist commentators find postmodernism debilitating: they feel that it disallows them from presuming, as Harding puts it, 'to be able to state "how the world is" or "what we should do"'.²

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This paper is an attempt to explore these issues by describing their occurrence within my own work — an actor-network analysis of the construction and maintenance of the UK Cervical Screening Programme (CSP).³ Indeed, the paper considers whether we *should* presume to be able to state ‘how the world is’ and ‘what we should do’.

I suggest that feminist approaches to science presently facing this postmodern dilemma frequently seek a resolution by adopting an epistemologically conservative standpoint that, for example, asserts the political impotence of approaches (such as actor-network theory in the sociology of scientific knowledge [SSK]) characterized by a rejection of dualisms and universalism.⁴ This way out of the dilemma has been diagnosed by some as a feminist failure of nerve.⁵ Moreover, it seems to be incompatible with feminist concerns, such as the recognition of plurality and heterogeneity and the search for non-dualistic ways of thinking.

It is worth noting that while this paper is largely concerned with feminists studying science and their relationships with SSK, these are not the only social scientists facing the dilemma outlined above:

... one of the key dilemmas of contemporary theorising ... is ... how to balance a theoretical rejection of essentialism, objectivism and universalism with a moral and political commitment to non-oppressive, democratic and pluralistic values.⁶

Moreover, within SSK, feminists are not the only ones charged with epistemological conservatism, as the well-known ‘Epistemological Chicken’ debate demonstrates.⁷ Collins and Yearley propose that the actor-network approach is philosophically radical but empirically reactionary and prosaic. In response, Callon and Latour argue that Collins and Yearley’s position is deontological and moralistic — an accusation which implies one of epistemological conservatism and failure of nerve.

Consequently, although the primary focus of this paper is the relationship between feminism, SSK and postmodernism, the issues that I want to explore, such as the relationship between political commitments and theoretical commitments, are applicable to much research in science and technology studies, as well as to debates raging in social theorizing more generally.

The Case Study: An Actor-Network Analysis of the UK Cervical Screening Programme

Introducing the CSP

The Cervical Screening Programme (CSP) was introduced nationally in 1966.⁸ It aims to prevent women dying from cervical cancer. That is, the CSP is a preventive medical intervention whereby 'healthy' women are encouraged to undergo a cervical smear test (CST). This involves obtaining a sample of cells from the woman's cervix (neck of womb) and subjecting them to laboratory analysis to detect changes that may indicate pre-cancerous abnormalities, so that they can be treated and the development of cancer prevented. There is a medical consensus that cervical cancer is linked to sexual activity, if not to sexual promiscuity. Hence the programme is directed at women who are sexually active.⁹

Though the CSP has existed in Britain for almost thirty years, it is not an unproblematic construction. Indeed, controversy has plagued the programme on many levels. Disputes have occurred over the aetiology of cervical cancer, the presumed natural progression of cancer from certain abnormalities, the causes of cervical cancer and the accuracy of laboratory analysis.¹⁰ An example of this last kind of problem is the 'major hiccup' in Liverpool in 1987 in which nine hundred CSTs over a four-year period were incorrectly reported as negative.¹¹ Moreover, despite the government-defined aim of the programme being to reduce mortality, some statistics have claimed that mortality has remained at approximately 2000 deaths from cervical cancer per year since its introduction.¹² However, the programme is publicly portrayed, via leaflets and the standard call and recall letters sent to women, as straightforward, unproblematic and unquestionably good for women.¹³ In short, the programme has been described as both a triumph and a failure.¹⁴ Within this context, the relationship of feminist commentators to the CSP has been problematized by some writers:

The test for cervical cancer may well be doing more harm than good . . . but . . . [t]he pap smear has even become a feminist issue, with advocates claiming that a well organized screening programme would save the thousands of women lost every year to the disease.¹⁵

The controversy and uncertainty surrounding the CSP do not necessarily indicate that it is an unusually problematic scientific programme. Indeed, SSK has been very good at exposing uncertainties, controversy and negotiation as characteristic of the development of 'ordinary' scientific knowledge; they are features of the production of even the most apparently stable scientific knowledge-claims, programmes and artefacts. For some researchers, it just depends upon where you are as to whether you see them or not.¹⁶ SSK has developed expertise in opening the black boxes of science and technology — the facts, machines and artefacts that emerge as monuments to the facticity and inevitability of scientific findings. SSK has become extremely skilled at this excavation work as it has opened these tombs with increasing flair and aplomb, and has examined their contents — the forgotten and invisible work, the controversy and the negotiation. SSK has demonstrated time and again that 'it could have been otherwise', and has revelled in exposing the contingent and negotiated nature of knowledge construction.¹⁷ In turn, this work has provided the fuel with which the determinacy and power of scientific knowledge-claims can be challenged.

However, while there is considerable consensus in science studies that opening the black boxes of science and technology is valuable and illuminating, there is disagreement and confusion over what to do once the contents flood out. Do we focus on describing the work therein? Do we and can we explain this work?¹⁸ Is it possible to give voice to the diversity of viewpoints that are exposed? How can we represent the indeterminacy and dynamism that we find without ourselves constructing black boxes of our own, and hence simplifying the complexity?¹⁹ It can be argued that some of us, perhaps those leaning more towards a postmodern perspective, have sought to *describe* the development of scientific knowledge, rather than to *explain* it. We have not been primarily concerned with making political claims about the status, safety or value of a particular technology, but rather have been more interested in deconstructing it, in unravelling and describing its construction processes. Indeed, Latour argues that explanation should not be a worthy goal.²⁰ It seems to me that 'the politics of explanation', as Latour terms it, is the basis of the charge of political impotence that some feminists have directed at some approaches in SSK — and of the charge of epistemological conservatism that some SSKers have directed at some feminisms.

The issue is the demand for explanation, and whether or not explanation should be a desirable goal for researchers. For some feminists, explanation is a prerequisite for action and change, and consequently is a necessity. This issue underlies the question I want to use to guide my exploration of the relationship between feminism and SSK. The question, as asked of me in relation to my research by an active feminist science studies researcher, is this: *Should women have a cervical smear test or not?*²¹

Questioner: Vicky, your work is about exposing indeterminacy in the cervical screening programme and about highlighting the multiplicitous identities and ambivalence of all the entities involved in the programme, from the lay woman participant to the doctor taking the smear to the cervical cells that sometimes do and sometimes don't change in predictable ways in relation to cervical cancer. You have referred to the programme as an actor-network constituted by a diversity of entities, each being defined in a specific way. Further, you have attempted to develop the actor-network approach to incorporate the ambivalence and multiplicity that you found, arguing that this not only characterizes the practice of the programme but that it actually contributes to the maintenance and development of the programme. While this is all very interesting, I have a question for you. Let me put it this way. I'm a woman, I'm getting older, I've had my kids, I'm very busy and I don't want to, nor have I the time to, think about all the ins and outs of the screening programme. That's your job. That's what you have been paid to do. So you tell me, should I have a cervical smear test or not?

Vicky: Well, to answer you in the way that you have posed the question, I think that is your decision. I can give you access to the information that I have but it is your decision. There are numerous uncertainties inherent in the programme and I can discuss with you how they are constructed and negotiated, along with how the identity of woman in the CSP is many and changing things.

Questioner: Yes, but as I said I accept that you have had far more time to consider this and to find information about this than I have got or am likely to have, so I am asking for your opinion.

Vicky: Well I think the answer will be different for different women and depending upon which of my many different identities I am assuming — that is, depending upon the context, I would have to give you different answers. Throughout my work I have become increasingly conscious of my own and others' multiplicitous identities and the value of acknowledging the many different perspectives on any given issue such as the value of participating in the CSP and the rightness of any particular feminist or sociological perspective. My initial interest in the CSP came, I think, from being a lay participant and having a distressing encounter with the programme. While this led to scepticism about the programme, along with some anger, I was also aware of an almost uncontrollable commitment to the value of the CSP. This may be partially a consequence of fear for my own health, and also partly due to my previous membership in the medical world as a qualified nurse. There again, as a nurse I

am aware of the problems with the CSP. Also relevant and influential seems to be my experiences of working in and being a user of a well women's centre. In sum I suppose I cannot answer your question because at a very personal level I am unsure of my feelings towards the CSP — I don't know whether to participate in it as a recipient or not — and intellectually I am also ambivalent. The theoretical networks that I have created, that I have participated in and that have evolved from my theorizing pull me towards different answers to your question and hence I cannot give you one answer.

Needless to say, the questioner felt that I should think about this more, and I agree with her. The result is this paper, which is attempting to explore the issues that this conversation highlights. First, the conversation exposes how, for some feminists approaching science, the personal is entwined with the political, and with theoretical agendas. Moreover, the conversation and my responses in particular, highlight how politics, theory and self do not always fit easily together. Secondly, the question resulted in my being grabbed by a worrying thought as I sat on the train going home from the conference: all the while that I have been engaged in constructing my analysis of the CSP, I have felt that I am the Translator/Spokesperson — the entity in control, defining and associating other entities such as the CSP and all its participants, feminist approaches to science and actor-network theory, to create my own theoretical network that I could change, mould and control.²² Perhaps, though, I had not taken my readings of Callon and Latour seriously enough; if I had, I might have realized that I am a construction as well as a constructor of the network.

My case study, then, emerges as an autonomous construction that defines me in certain ways and gives me an identity. That identity is heterogeneous. Should I therefore accept the ambivalence and contradictions inherent in my multiple identity, and celebrate my inability to explain and to solve? I am continually reflecting upon my-selves, and rather than, as Woolgar demands of sociologists of science, 'Interrogating self', I find myself 'Interrogating selves'.²³ Below, I jump between different feminist epistemologies as I enrol The Question into my particular version of the world in an attempt to answer it — along with the prior question of whether or not I am able to make such pronouncements in the first place. In the process of suggesting possible answers and exposing the paradoxes that result, the question gets translated into a theoretical issue concerning the relationship between politics, theory, practice and me.

Answers?

1. *Should women have a cervical smear test or not?*

Yes, they must go for a cervical smear test.

I could call this a feminist empiricist response.²⁴ That is, I could say that it is essential for women to participate in the CSP because the only way that we can rid medical science and programmes such as the CSP of their male bias is through increased female participation.

Some feminists and women's health writers commenting on the CSP can be seen to have adopted this approach. For example, while they are critical of the ways in which women in the CSP have been labelled promiscuous, defining this as a consequence of male bias, they simultaneously stress that women must attend and they demonstrate an overriding commitment to the CSP as good for women. For example:

Of course we need better organised screening and more money for health care. But isn't it time for women to ask why the medical profession advocated a policy of screening but denied women the information that would allow them to choose primary prevention? Why did the information that women's promiscuity 'caused' cervical cancer get through to the public whereas the risks of male promiscuity, the textile industry for women workers, men's dusty jobs or the pill did not?²⁵

. . . the cause of cervical cancer has been presented as the 'permissive society' and blamed on women's own actions. This is a simplistic and distorted presentation. . . . It tends to make women hesitate to talk to others about it. Don't hesitate! . . . Sharing your feelings could make you feel better, and the way to stop this 'victim-blaming' is for women to support each other.²⁶

. . . social taboos and prejudices have encouraged both sexes to regard cervical cancer as a 'dirty' disease, one linked solely to promiscuity. Research has now shown that this is, in fact, not the case and it is hoped that more women will now present themselves for screening.²⁷

However, such a stance poses a dilemma for feminists. In relation to the CSP one feminist commentator has written:

Women with pre-cancerous or cancerous changes of the cervix have now become victims par excellence. The screening women campaigned for offers them early detection at the price of being labelled.²⁸

In a second paper this commentator states that, 'Neither the ethics, the efficacy, nor the adverse effects of screening have been adequately discussed by women's organizations'.²⁹

Adopting a feminist empiricist stance can promote increased participation of women in the CSP/science, but can result in an unquestioning acceptance (and even validation) of the sexist foundations of the CSP/science. Longino, in relation to feminist epistemologies for science, defines this paradox thus: 'Feminists — in and out of science — often condemn masculine bias from the vantage point of commitment to a value-free science'.³⁰ Turner has highlighted how medical sociologists often occupy a similar paradoxical position:

Too often the sociologist has not been sufficiently aware of the paradox of their own position. On the one hand, they criticise the medicalization of society as a form of medical dominance, on the other they recommend more intensive and interventionist medicine in the management of lifestyles and everyday interaction by arguing a case for extensive preventive approaches. Preventive medicine is far more interventionist than conventional curative medicine, yet sociologists have been on the whole advocates of preventive medicine in response to the social causation of chronic disease in modern societies.³¹

2. *Should women have a cervical smear test or not?*

Yes, they should: but it is important that they are informed by the experiences of other women

This answer I associate with a feminist standpoint epistemology.³² It is characterized by a commitment to the CSP as a rare concession to the too frequently ignored needs of women. Consequently the CSP must be maintained, but women's identity within it must be changed. Women must be empowered rather than oppressed. They must be able to engage in the dominant discourses of medical science: this is to be achieved by women participating in the CSP, and subsequently sharing and collating their experiences. For example, the aim of much feminist writing on the CSP is summed up in the following introductory statement from an influential booklet entitled *A Feminist Approach to Pap Tests*:

We hope that the information we are presenting will help to relieve some of the stresses by providing easily understood explanations, connecting women's common experiences, and by supplying women with information to make thoroughly informed decisions.³³

And a women's health book states:

Knowledge is power. Knowing what is happening to you makes you far less vulnerable, and means that you can cope with what is going on. Understanding

the facts and knowing what you are talking about when speaking to a doctor means that you can address her/him with authority.³⁴

This response can be conceptualized as a feminist construction of an alternative CSP within which the identity of woman is redefined as an active informed participant responsible for her own health. For example, some writers stress the invasive nature of the Cervical Smear Test, and emphasize that medical professionals lack an understanding of this. However, these writers do so because they see this problem as a deterrent to women's participation rather than as an important point in its own right.³⁵ Consequently the CSP remains intact as a valid intervention.

An alternative example of a feminist standpoint response to the test is the way in which some feminist commentators try to expose an over-simplification of women's daily lives and commitments by the government CSP. They do this by arguing that women's multiple commitments are inappropriately prioritized by women themselves, and that this misperception itself prevents women's participation in the CSP:

Many middle-aged women think of themselves as less important than their husbands or children and do not go for a cervical smear to protect themselves in their own right. This attitude will only change as the general struggle against women's oppression grows stronger.³⁶

Saffron takes a stance against the general societal oppression of women, which she sees as influencing women's identity within the CSP — but she does so with a firm commitment to the value of the CSP and to women's participation in it. In sum, women's commitments emerge as wrongly prioritized, and must be changed to ensure that they will participate in the CSP.

Another text aimed at informing women about the CSP and clearly telling women that they should attend, states:

Well women care recognises that women need to look after themselves, if for no other reason than to allow themselves to be better carers of their families. . . . More important to many people is the fact that women have as much responsibility to themselves as to others, and have the right to put their own well-being on an equal or more prominent footing. . . . Well women care is 'empowering': not only does it give us responsibility for our lives, it gives us far more control.³⁷

While an alternative CSP is constructed by these commentators on the basis of a reconceptualization of women's identity, as she

becomes informed and empowered, 'woman' is also re-simplified and re-black-boxed. The voices of some women are silenced as a consequence of these commentators' commitment to the CSP, which in turn can be seen to reflect a commitment to the general cause of empowering women and resourcing their particular health needs. For example, the experiences and views of women who choose not to participate nor to prioritize the CSP are occluded and undermined. So too are the voices of those who inhabit what Star has called a 'high tension zone'³⁸ — that is, women who are neither excluded from nor enrolled within the CSP, since they define themselves as both participating and not participating in it.³⁹ Uncertainty and ambivalence, along with the decentredness of woman, is lost. Woman in the 'feminist and women's health activist CSP' is falsely universalized as the commentators adopt a standpoint for women and for the CSP. Harding's question to feminist standpoint epistemologists seems appropriate here: 'Can there be a feminist standpoint if women's (or feminists') social experience is divided by class, race, and culture?'.⁴⁰ We might also note Flax's comments:

Within feminist theory a search for a defining theme of the whole or a feminist viewpoint may require the suppression of important and disconcerting voices of persons with experiences unlike our own.⁴¹

3. *Should women have a cervical smear test or not?*

I do, but . . .

I could say that I have decided to have a cervical smear test but that, as my decision stems from my particular and partial perspective, I cannot speak for anyone else. Taking my social theory seriously I can even lend some weight to such a response by defining it as 'situated'. That is, I can describe my particular biography and my particular historical location but I will not extrapolate from that. I can talk and write about my many different identities — nurse, social researcher, women's health activist — and suggest how I might give different responses to the question depending upon which identity is most salient. I can also locate myself in theorizing that wishes to legitimate ambivalence, expose uncertainties and contradictions, and acknowledge heterogeneity of identity. Moreover, I can situate myself alongside those feminists who have stressed the value for feminist projects of postmodernism's wariness toward generalizations and universalisms:

From the late 1960s to the mid-1980s, feminist theory exhibited a recurrent pattern: Its analyses tended to reflect the viewpoints of white, middle-class women of North America and Western Europe. The irony was that one of the powerful arguments feminist scholars were making was the limitation of scholarship which falsely universalised on the basis of limited perspectives. For some feminists, postmodernism provides a basis for avoiding the tendency to construct theory that generalises from the experiences of Western, white middle-class women.⁴²

So from my white, middle-class, western perspective I should not be generalizing about women and telling them whether or not they should participate in the CSP.

This seems to be a reasonable response, until I am again asked the same question — this time not by a white, middle-class, western academic making a point about my feminist political impotence, but by a diversity of women in many different contexts. I still feel that it is an important question and that I have not answered it, but have rather avoided answering it. I am uncomfortable about my inability to answer the question without drawing in many academic allies and referring to some vast theoretical networks. The whole question seems to bring to the fore the relationship between theory and politics and to suggest the possibility of distinguishing between the two, even though feminists have fought so hard to dissolve such a dichotomy. Indeed, actor-network theory proposes that such distinctions emerge through constructed actor-networks and should not, therefore, be assumed to exist ‘naturally’.⁴³

Harvey argues that ‘situatedness’ can be construed in different ways, and the conceptualization I have offered above he would probably call ‘vulgar situatedness’.⁴⁴ He argues that such a conceptualization is frequently ‘used as a rhetorical device to enhance the authenticity and moral authority of one’s own account or to deny the veracity of other accounts’.⁴⁵ That is, I can validate my own claims through a rhetoric which exposes their partiality and particularity, and I can then use this rhetoric to invalidate and deny the validity of looking for an answer to the question I have been posed. Furthermore, Harvey, while acknowledging that this is a difficult issue for contemporary social science to confront, nevertheless states:

... a relativist, essentialist and non-dialectical view of situatedness generates immense political difficulties. . . . No one could assume the right or obligation

to speak for others' let alone against the oppression of anyone whose identity is construed as 'other'.⁴⁶

It seems that some feminists, such as my original questioner, would agree with Harvey's argument. Furthermore, I can argue with myself that I still have not answered the initial question, nor the more general criticism that my theorizing (which rejects dichotomies, celebrates heterogeneity and exposes ambivalence and multiplicity) is politically impotent when it comes to saying something against/about the domination of women by medical science and technology. Approaches such as actor-network theory may be theoretically radical and useful for feminists researching science, but can they be politically useful and productive? This criticism has been addressed to actor-network theory not only from within feminism but also from within science and technology studies. It is clearly time for the actor-networker in me to address the question of whether or not women should have a cervical smear test.

4. *Should women have a cervical smear test or not?*

Should we be asking this question, let alone trying to answer it?

Collins' and Yearley's scathing attack on actor-network theory argued that it leaves the sociologist impotent and uncomfortably exposed to the hegemony of science.⁴⁷ They argue that a non-dualistic vocabulary and methodology, with its symmetrical treatment of humans and non-humans, not only occludes explanations of scientists' actions, but worse, its effect in the use of empirical material is reactionary and prosaic. So one can identify here another meaning of my questioner's argument. While my actor-network analysis of the CSP might be an interesting account, it neither suggests nor promotes change. For Collins and Yearley, the upshot of such an approach is a return to the supremacy of the voice of science, for it is the scientific and technological accounts of the non-human that are given voice:

This backward step has happened as a consequence of the misconceived extension of symmetry that takes humans out of their pivotal role. If non-humans are actants, then we need a way of determining their power. This is the business of scientists and technologists — it takes us directly back to the scientists' conventional and prosaic accounts of the world from which we escaped in the early 1970s.⁴⁸

My case study of the CSP has attempted to incorporate a multiplicity of perspectives on the CSP, and on the actors that

constitute it. I have not depended solely upon the accounts of medical scientists. However, this is not the important point I want to make here. I am more interested in what Collins and Yearley propose as an alternative, and how Callon and Latour respond. Collins and Yearley propose that the sociologist of science should become promiscuous and adopt a principle of meta-alternation, that involves switching between natural realism and social realism — from explanations that start with the existence of objects to explanations that start with society. For Callon and Latour, this alternation is ‘another name for blithe ignorance’.⁴⁹ They argue that it is a mistake to begin analyses of science and technology with definitions of what is social and what is natural because such definitions are constructed by the very same scientific hegemony that the analyst is fighting.

So one answer to the question I have been posed might be to refer to the way in which gender/woman is defined through particular constructions. The aim of the analyst is not to contribute to the continued stabilization of such constructions, but to describe how they are made. Consequently the analyst is talking about how things could have been otherwise rather than assuming the ahistorical existence of such categories. Actor-network theory denies the analyst the comfort of drawing upon the existence of dualisms, such as male *versus* female, oppressor *versus* oppressed, science *versus* society, human *versus* non-human, prior to analysis of specific constructions of the science/society relationship.⁵⁰ For actor-network theory, power is a consequence rather than a cause of action. Power relations are the consequence of defining and associating entities.⁵¹ Indeed, the response from an actor-network perspective may be to deny the importance or relevance for the analyst of The Question I have been posed, because it assumes certain categories and dualisms and presupposes particular associations. Callon and Latour say of Collins and Yearley’s critical paper that it:

. . . is a moral and deontological paper. The field of science studies has been engaged in a moral struggle to strip science from its extravagant claim to authority. Any move that waffles on this issue appears unethical since it could help scientists and engineers to reclaim this special authority which science studies has had so much trouble undermining.⁵²

The term ‘moral’ seems to have become a dirty word here. I could make the same attack upon my questioner, that her criticism of my

work is a moral and deontological one, grounded too much in a humanist, atheoretical perspective.

However, I am a little concerned that if I were to do so I may be entering a paradoxical corner. In criticizing the ‘morality’ of Collins and Yearley’s stance, are not Callon and Latour using a rhetorical device to enhance the authenticity and moral authority of their own account? Moreover, these authors seem more than willing to impute moral and political interests to explain the actions of their opponents. So it is only to be expected that we don’t have to look very hard at actor-network theory and its historical situatedness to see that it, too, can be accused of being imbued with politics and morals. For example, I can argue that actor-network theory initially was motivated by a concern to say something to other sociologists of science about their mistreatment of non-humans. And Star can argue that the actor-networks constructed by Callon and Latour are inherently political precisely because the political implications of their heuristic levelling of differences is that the voices and experiences of those that have been marginalized and excluded from a network are concealed. As a result, Star emphasizes the importance of looking at the consequences of constructions for all the entities enrolled.⁵³

Needless to say, Callon and Latour are not unaware of the problem of the incorporation of differences entailed in their approach. In a footnote they state:

The recognition of the historicity of differences, their irreversibilisation, their disintegration and their proliferation passes by way of a bitter struggle against the assertion of one great a-historical divide.⁵⁴

Callon and Latour’s response to this dilemma is that we engage in describing the construction and transformation of differences, rather than their explanation. They claim that they are not denying differences, just refusing to consider them as *a priori*.

Furthermore, as Star highlights, Callon and Latour are now becoming increasingly concerned with the ‘nature of stabilisation of large scale networks’; or as Latour himself puts it, in ‘Technology Is Society Made Durable’, their aim is to ‘rephrase some of the traditional questions of social order and especially that of the durability of domination of power’.⁵⁵ For Latour, this involves re-addressing the relationship between description and explanation:

Explanation does not follow from description; it is description taken that much further. We do not look for a stabilised and simplified description before we

begin to propose an explanation. On the contrary, we use what they do to an innovation or a statement to define the actors, and it is from them and them alone that we extract any 'cause' we might need. Paradoxically our explanations are 'internalist' in the sense that they come from the inherent topography of specific networks.⁵⁶

This leads Latour on to say that power and domination are the words given to the stabilization of actors' own efforts at rendering each other's behaviour more predictable. 'Power' and 'domination' are thus not an appropriate account of how such stabilizations come into being. In this way, Latour concludes that there is no need to go outside networks in order to find explanations or to search for global causes: 'If something is missing it is because the description is not complete. Period. Conversely, if one is capable of explaining effects of causes, it is because a stabilised network is already in place'.⁵⁷ In conjunction with this, Latour directly addresses the accusation of 'immorality, apoliticism, or moral relativism':

Refusing to explain the closure of a controversy by its consequences does not mean that we are indifferent to the possibility of judgement, but only that we refuse to accept judgements that transcend the situation. For network analysis does not prevent judgement. . . . Efficiency, truth, profitability, and interest are simply properties of networks, not statements. Domination is an effect not a cause. In order to make a diagnosis or a decision about the absurdity, the danger, the amorality or the unrealism of an innovation, one must first describe the network.⁵⁸

Explanation from Situated Description: Co-Evolving Politics, Theory and Me

5. Should women have a cervical smear test or not?

No women should but all women could.

According to Latour, the answer to The Question I have been posed would seem to lie within my description of the CSP actor-network. However, Latour qualifies what he means by the description of a network. It is not to be had just by following a single actor, as (arguably) attempted in the earlier actor-network case studies; what is required is an analytical multi-perspectival following of all actors involved in a network:

If we display a socio-technical network — defining trajectories by actants' association and substitution, defining actants by all the trajectories in which

they enter, by following translations and, finally, by varying the observer's point of view — we have no need to look for any additional causes. The explanation emerges once the description is situated.⁵⁹

My actor-network analysis of the CSP has attempted to do just what Latour is proposing. I have followed various actants in the CSP actor-network and looked at how they define their own identity and the identities of other actors with whom they are associated. Actors emerge from this analysis as multiplicitous mutable identities, as they engage in the complex and continuous process of negotiating their own and others' identities within the CSP. Through this intensive description of the socio-technical network of the CSP, I have been able to say something about how the effects of the particular associations that make up the network include the construction of woman in the CSP as sexually promiscuous, the simplification of woman's identity, the exclusion of woman from decision-making, and the subjugation of woman's knowledge and experience of her body.⁶⁰ Furthermore, I have been able to situate these constructions in the discourse of particular actors, such as medical professionals. However (and this is the important point here), I have also emphasized that such constructions are continually negotiated and mutable. For example, General Practitioners have been engaged in redefining the identity of woman in the CSP from passive, ignorant participants to active, informed decision-makers who sometimes choose not to participate. This is in response to a recent government redefinition of General Practitioners' rôle in the programme, and the new system of payment according to the number of cervical smear tests they carry out.⁶¹

Hence, actors in the CSP are not stable, uniform identities but rather are engaged in continually redefining their own and others' identities — and consequently in transforming, destabilizing and maintaining the CSP actor-network. As Latour states, the actor doing the defining is in a complex and evolving relation with those being defined.⁶² Furthermore, I would add that, as the analyst's viewpoint varies, then the actor which is seen to be doing the defining also varies. Moreover, the analyst can also be seen as an actor engaged in defining those that he/she is observing.

Latour states that the durability of the oppressor's position is not to be explained by (its) 'power' but only by the convergence between what it expects others to do and what others expect it to do. For Latour, 'It is this negotiation process that is always

forgotten by those who use already acquired domination to explain a future one'.⁶³ So, the extent to which women's knowledge and experience is oppressed within the CSP can be seen as a function of the degree of convergence between, for example, what medical professionals, the government, feminists and social researchers (such as myself) expect of women, and what women expect of these others and of themselves. In order to answer The Question in the terms in which it was put, I would need to speak for women and define their proper identity in the CSP: either they should or they should not be participants. That is, I suggest that to engage in a 'should' discourse ('should women have the test?') is to engage in an oppressive and exclusionary discourse. Moreover, a definitive response to The Question conceals the negotiability and multiplicity of identity that characterizes the actors in the CSP, along with the complex and evolving nature of the relationship between those being defined and those doing the defining.

A possible alternative way of responding to The Question that may be compatible with my concerns as defined above may be found in the work of theorists trying to find ways to incorporate values within the postmodern condition. For example, Harvey suggests that we appeal to a dialectical sense of situatedness which he defines as 'a dialectical power relation between the oppressed and the oppressor'.⁶⁴ This seems to incorporate some of the negotiability and evolutionary nature of the relationship between the definer and the defined that Latour describes above. For Harvey, this conceptualization of situatedness rests upon a view of the individual subject as 'someone who has no solid identity, but who is a bundle of heterogeneous and not necessarily coherent impulses and desires'. Consequently, 'Situatedness is taken out of its wooden attachment to identifiable individuals and their biographies and is itself situated as a play of difference'.⁶⁵ This allows Harvey to say that we can define propositions for social action without abandoning our acknowledgement of the heterogeneity of identities, and without universalizing. For not only must we evaluate critically all propositions for social action in terms of their situatedness and the positioning of the argument and the arguer: we must also recognize arguers as 'bundles of heterogeneous impulses, many of which derive from an internalisation of "the other" within the self'.⁶⁶ Moreover, situatedness is itself heterogeneous and differentiated. So, he concludes, 'In the last instance, it is the social construction of situatedness which matters'.⁶⁷

So, in response to The Question, I could state that I too can participate in network-building. I can recognize my own dialectical situatedness — that I am both constructing and constructed by the networks that I define. From these networks co-evolve my political, moral, intellectual and personal commitments. I cannot easily differentiate between them; in some cases, I feel alienated by one perspective, such as feminism, when I adopt another, such as the actor-network approach. I could begin to use this to make a decision about whether or not I feel that women should participate in the CSP, and I can expect others critically to evaluate my propositions, and those of others such as medical professionals and feminists, through acknowledging that we are all heterogeneous and internally inconsistent. While I am unsure that women would find this a helpful response it does allow me, at last, to offer an answer to The Question that I am comfortable with:

No women should have a cervical smear test but all women could.

Answering the question of whether women should have a cervical smear test begs the prior question of whether any woman ought to feel ‘morally coerced’ into participation. Surely we need to talk more about *could* than the guilt-inducing discourse of *should*, which seems to be based in a discourse of oppression and domination. From my analysis of the CSP, I am clear that it is not appropriate for me to state whether women should or should not have a cervical smear test. Were I to do so, I would be reproducing and contributing to the stabilization of oppressive discourses within the CSP which induce guilt and distress by defining women as stupid and ignorant if they do not attend. Many lay women spoke about this guilt and internalized, at one level, the medical discourse in which non-participation signifies ignorance:

You should go, you must be stupid not to go . . . they should make women have it. I mean it's for our own good. (AM, 11.90)

So I opened the letter and I read it and thought, no I'm not going to do that, I just couldn't face it again and I mentioned it in work. I work mostly with women and they all said, 'Oh you've got to go, you'll have to go, you can't not go'. Anyway I so much didn't want to go but I thought that perhaps I should go that I actually, instead of tearing the letter up which is what I would normally do, I stuck it in the pending tray and it's still pending. It's been there about a month now but in fact I'm not going to go back. (MS, 2.90)⁶⁸

There is no room in a ‘should’ discourse for ambivalence, negotiation of identity and multiple identities. Morally, politically, intellectually and personally I cannot tolerate that. My application

of actor-network theory to the CSP suggests the ongoing evolution of the programme. It suggests how the actors involved (including lay women, cervical cells, the laboratory and general practitioners) consist of a range of mutable identities, engaged in complex processes of negotiating their own and each other's identities. Consequently, despite the durability of the CSP — it has existed for almost thirty years — it is not composed of a series of discrete stable entities. Rather the CSP is a dynamic construction. Once we recognize the complex and evolving character of constructions such as the CSP, and the way in which definitions and identities are emergent and continually negotiated, then the stability needed for making that one definitive decision about, for example, the rightness of lay participation, ceases to exist.

• NOTES

I acknowledge the participants in the Workshop on 'Feminism, Constructivism and Utility', at Brunel University, London (September 1993), particularly Janet Rachel and John Law for their encouragement, and Judy Wajcman for posing The Question to me. An earlier version of this paper was presented to the Department of Sociology and Social Anthropology, Keele University, January 1994, and I am grateful for the comments then received. Thanks to Kath Smart, Mike Michael and Malcolm Ashmore, and the reviewers of this journal, for their comments.

1. Linda J. Nicholson (ed.), *Feminism/Postmodernism* (New York & London: Routledge, 1990).

2. Sandra Harding, *Whose Science? Whose Knowledge? Thinking from Women's Lives* (Milton Keynes, Bucks.: Open University Press, 1991), 304. See also Nicholson, op. cit. note 1.

3. Previous accounts of my application of the actor-network approach to the UK CSP include Vicky Singleton and Mike Michael, 'Actor-Networks and Ambivalence: General Practitioners in the Cervical Screening Programme', *Social Studies of Science*, Vol. 23, No. 2 (May 1993), 227–64; and Singleton, *Science, Women and Ambivalence: An Actor-Network Analysis of the Cervical Screening Programme* (unpublished PhD thesis, School of Independent Studies, Lancaster University, 1992). For another attempt of mine to put feminist approaches into dialogue with the actor-network approach, through a case study of the roles played by feminists and lay women in the cervical screening programme, see Singleton, 'Networking Constructions of Gender and Constructing Gender Networks: Considering Definitions of Woman in the British Cervical Screening Programme', in Keith Grint and Rosalind Gill (eds), *The Gender/Technology Relation: Contemporary Theory and Research* (London: Taylor & Francis, 1995), 146–73.

4. I am referring to the actor-network approach as developed within SSK and associated, in the main, with Michel Callon, Bruno Latour and John Law. For the main texts describing and developing this approach, see Michel Callon, 'Some Elements of a Sociology of Translation: Domestication of the Scallops and the Fishermen of St Brieuc Bay', in J. Law (ed.), *Power, Action and Belief* (London: Routledge, 1986), 196–233; Callon, 'The Sociology of an Actor-Network: The Case of the Electric Vehicle', in M. Callon et al. (eds), *Mapping the Dynamics of Science and Technology* (London: Macmillan, 1986), 19–34; Callon, 'Society in the Making: The Study of Technology as a Tool for Sociological Analysis', in Wiebe E. Bijker et al. (eds), *The Social Construction of Technological Systems* (Cambridge, MA & London: MIT Press, 1987), 83–103; Callon, 'Techno-Economic Networks and Irreversibility', in Law (ed.), *A Sociology of Monsters? Essays on Power, Technology and Domination* (London: Routledge, 1991), 132–61; Bruno Latour, 'Technology is Society Made Durable', in Law (ed.), *ibid.*, 103–31; Latour, *Science in Action: How To Follow Scientists and Engineers Through Society* (Milton Keynes, Bucks.: Open University Press, 1987); Latour, *The Pasteurization of France* (Cambridge, MA: Harvard University Press, 1988); Latour, 'Mixing Humans and Nonhumans Together: The Sociology of a Door-Closer', *Social Problems*, Vol. 35 (1988), 298–310; John Law, 'Technology and Heterogeneous Engineering: The Case of Portuguese Expansion', in Bijker et al. (eds), *op. cit.*, 111–34; Law, 'Notes on the Theory of the Actor-Network: Ordering, Strategy and Heterogeneity', *Systems Practice*, Vol. 5 (1992), 379–93.

5. Keith Grint and Steve Woolgar, 'On Some Failures of Nerve in Constructivist and Feminist Analyses of Technology', *Science, Technology, & Human Values*, Vol. 20, No. 3 (Summer 1995), 286–310; and in Grint & Gill (eds), *op. cit.* note 3.

6. Judith Squires (ed.), *Principled Positions: Postmodernism and the Rediscovery of Value* (London: Lawrence & Wishart, 1993), 6.

7. H.M. Collins and Steven Yearley, 'Epistemological Chicken', in Andrew Pickering (ed.), *Science as Practice and Culture* (Chicago, IL: University of Chicago Press, 1992), 301–26; M. Callon and B. Latour, 'Don't Throw the Baby Out With the Bath School: A Reply To Collins and Yearley', *ibid.*, 343–68.

8. Details about the programme are taken from government documents that defined and developed it. Great Britain Ministry of Health, *Population Screening for Cancer of the Cervix, Health Memorandum, HM(66)76* (London: Ministry of Health, 1966); Great Britain Department of Health and Social Security, *Screening for Cervical Cancer, Health Circular, HC(84)17* (London: Department of Health and Social Security, 1984); Great Britain Department of Health and Social Security, *Cervical Cancer Screening, Health Circular, HC(88)1* (London: Department of Health and Social Security, 1988).

9. Wendy Savage and Anne McPherson, 'Cervical Cytology', in McPherson and A. Anderson (eds), *Women's Problems in General Practice* (Oxford: Oxford University Press, 1983), 179–202. This text is written for medical practitioners. Savage and McPherson review the available medical literature and demonstrate that while there is uncertainty over this issue, there is a medical consensus that cervical cancer is linked to sexual activity and to multiple sexual partners. Laboratory staff analyzing cervical cell samples are instructed to report on finding Human Papilloma Virus or Herpes Virus, and the women so affected are thereafter placed in a high-risk category and requested to attend more frequently for cervical smear tests. Both of these diseases are defined as sexually transmitted. (Laboratory fieldwork, 1990–92.)

10. Useful overviews of the debates include Jocelyn Chamberlain, 'Failures of the Cervical Cytology Screening Programme', *British Medical Journal*, Vol. 289 (6 October 1984), 853-54; National Co-ordinating Network, *First Annual Report: NHSCSP* (Radcliffe Hospital, Oxford: National Co-ordinating Network, 1991); A. Singer and A. Szarewski, *Cervical Smear Test: What Every Woman Should Know* (London: Macdonald, 1988).

11. J. Chomet and J. Chomet, *Cervical Cancer: All You and Your Partner Need to Know about its Prevention, Detection and Treatment* (Wellingborough, Northants.: Thorsons, 1989), 52. There was an internal review of this incident which concluded that a particular consultant pathologist had made massive errors of professional judgement for which there was no logical explanation. Laboratory quality control procedures were implemented country-wide. There was a campaign for a public inquiry, headed by one of the Liverpool women involved (LH). However, there was no public inquiry, although LH did make a statement to the internal review. The author has spoken, although LH on a number of occasions, and LH has recently published a book documenting her experiences: Lily Hopkins, *I'm Alive* (Liverpool: Changing Places Publications, 1991).

12. In an influential review of the UK CSP, Roberts stated that there were 2068 deaths from cervical cancer in 1980, compared to 2434 deaths in 1968: see A. Roberts, 'Cervical Cytology in England and Wales, 1965-80', *Health Trends*, Vol. 14 (1982), 41-43. Following comparisons with the mortality statistics of other countries with CSPs, a Working Party set up by the Department of Health and Social Security Committee on Gynaecological Cytology in 1980 reported that 'the UK screening programme appears to be a relative failure': G.J. Draper, 'Screening for Cervical Cancer: Revised Policy. The Recommendations of the DHSS Committee on Gynaecological Cytology', *Health Trends*, Vol. 14 (1982), 37-40, at 37. For a recent review of the literature and an indication of the consensus over the failure of the UK CSP to reduce mortality from cervical cancer, see K. Johnston, *Screening for Cervical Cancer: A Review of the Literature* (University of Aberdeen: Health Economics Research Unit Discussion Paper, April 1989). See also National Co-ordinating Network, *First Annual Report*, op. cit. note 10.

13. For example, one leaflet states: 'The cervical smear test is a very simple, painless procedure. It is an early warning test which shows if there are any changes in the cells of the cervix which MIGHT develop into cancer': *The Female Cancer: Cancer of the Cervix, Your Questions Answered* (London: Durex Contraception Information Service in collaboration with the Women's National Cancer Control Campaign, 1989). Statements in the standard letters sent to women inviting them to have a CST include: 'The test is straightforward and painless and enables doctors to diagnose a condition which later may develop into cancer of the neck of the womb whilst it is still at a stage when treatment can prevent this happening'.

14. The CSP emerges from some texts written for lay women as a demonstration of the certitude and accomplishments of modern medical science. 'During the last two decades, . . . there have been enormous advances in the detection as well as the treatment of cancer. With the most modern screening techniques it is now possible to detect and to treat potential cancer of the cervix in its pre-cancerous state' (Chomet & Chomet, op. cit. note 11, Introduction). Tina Posner and Martin Vessey refer to the CSP as an optimistic area of modern preventive medical science: *Prevention of Cervical Cancer: The Patient's View* (London: King Edward's Fund for London, 1988). References to the 'failure' of the CSP are often

accompanied by references to continued mortality from cervical cancer despite the 20-plus-year existence of the programme (see the texts cited in note 12). In addition, see the interesting debate in the medical literature initiated by a paper suggesting not only that the CSP has failed, but that it may do more harm than good: J.S. McCormick, 'Cervical Smears: A Questionable Practice?', *The Lancet* (1989), Vol. 22 (22 July), 207–09, and especially the replies to McCormick in *ibid.* (9 September), 627–29.

15. L. McTaggart, 'The Smear Campaign', *What Doctors Don't Tell You*, Vol. 1, No. 3 (March 1990), 1–2. This journal is published from 77 Grosvenor Avenue, London, N5 2NN, UK.

16. H.M. Collins, 'Certainty and the Public Understanding of Science: Science on Television', *Social Studies of Science*, Vol. 17, No. 4 (November 1987), 689–713. Collins suggests that the public's usual distance from the processes of scientific knowledge production leads to public enchantment with science and, conversely, that when the public gets closer to the scene of knowledge production and thus comes upon the inevitable negotiations, errors and uncertainty, the response is disenchantment and rejection.

17. Susan Leigh Star, 'Introduction: The Sociology of Science and Technology', *Social Problems*, Vol. 35 (1988), 197–205, at 198.

18. Commentaries on these issues are many; the debate is long-standing and ongoing. Useful references include: H.M. Collins, *Changing Order: Replication and Induction in Scientific Practice* (London: Sage, 1985); G. Nigel Gilbert and Michael Mulkay, *Opening Pandora's Box: A Sociological Analysis of Scientists' Discourse* (Cambridge: Cambridge University Press, 1984); B. Latour, *Science in Action*, *op. cit.* note 4; Latour and S. Woolgar, *Laboratory Life, The Social Construction of Scientific Facts* (Beverly Hills, CA: Sage, 1979); Mulkay, *Sociology of Science: A Sociological Pilgrimage* (Milton Keynes, Bucks.: Open University Press, 1991).

19. The debate on these issues is long-standing and continues to rage. Useful references include: Malcolm Ashmore, *The Reflexive Thesis: Wrighting Sociology of Scientific Knowledge* (Chicago, IL: The University of Chicago Press, 1989); Mulkay, *op. cit.* note 18; S. Woolgar, *Science: The Very Idea* (New York & London: Tavistock & Ellis Harwood, 1988); Woolgar (ed.), *Knowledge and Reflexivity: New Frontiers in the Sociology of Knowledge* (London: Sage, 1988).

20. B. Latour, 'The Politics of Explanation: An Alternative', in Woolgar (ed.) *Knowledge and Reflexivity*, *op. cit.* note 19, 155–76.

21. This question was initially addressed to me following the presentation of a paper, 'Actor-Network Theory — A Useful Tool for Feminists Approaching Science?' at the 'Feminism, Constructivism and Utility' conference, held at Brunel University, London, in September 1993; a revised version of this paper is published in Grint & Gill (eds), *op. cit.* note 3. I am grateful to the questioner for posing The Question, which led to an earlier version of the present paper being presented in the Department of Sociology and Social Anthropology at Keele University in January 1994. I appreciate the feedback I received from the participants in the latter seminar.

22. Actor-network theory has evolved a variety of terms with which to conceptualize the process whereby scientific and technological artefacts are constructed. A diversity of entities are enrolled into a network, and that network is

conceptualized as constituting the artefact. That is, a diversity of entities are translated — defined and associated, and thereby given a specific role to play by a translator that sets itself up as their spokesperson. One paper which clearly outlines the use of these terms is Callon's 'Electric Vehicle' (op. cit. note 4). In the case of the CSP, in 1966 the documents defining the initial construction of the programme indicate that the British government set itself up as the translator spokesperson (Great Britain Ministry of Health, op. cit. note 8). It defined and associated a diversity of entities including hospital pathology laboratories, general practitioners, lay women, cervical cells and cervical cancer.

23. Woolgar, *Science*, op. cit. note 19.

24. As defined by Sandra Harding, *The Science Question in Feminism* (Milton Keynes, Bucks.: Open University Press, 1986).

25. J. Robinson, 'Cervical Cancer — Doctors Hide the Truth', in S. O'Sullivan (ed.), *Women's Health: A Spare Rib Reader* (New York & London: Pandora Press, 1987), 49–51, quote at 51.

26. T. Posner, *An Abnormal Smear: What Does That Mean?* (London: Women's Health and Reproductive Rights Information Centre, 1987), 4.

27. Chomet & Chomet, op. cit. note 14, 12.

28. J. Robinson, 'Cervical Cancer: A Feminist Critique', *The Times Health Supplement* (London), No. 5 (27 November 1981), 16.

29. Robinson, op. cit. note 25, quote at 51.

30. H.E. Longino, 'Can There Be a Feminist Science?', in A. Garry and M. Pearsall (eds), *Women, Knowledge and Reality: Explorations in Feminist Philosophy* (Boston, MA & London: Unwin Hyman, 1989), 203–16, quote at 212.

31. Bryan Turner, *Medical Power and Social Knowledge* (London: Sage, 1987), 224.

32. Harding (op. cit. note 24) reviews the literature and defines a feminist standpoint epistemology. See also Hilary Rose, 'Beyond Masculinist Realities: A Feminist Epistemology For the Sciences', in Ruth Bleier (ed.), *Feminist Approaches to Science* (New York: Pergamon Press, 1986), 57–76.

33. R. Barnett and R. Fox, *A Feminist Approach to Pap Tests* (Vancouver: Vancouver Women's Health Collective, 1986), 1.

34. Susan Quilliam, *Positive Smear* (London: Penguin, 1989), 79.

35. References here include an information sheet, L. Doyal, *Women's Health and Cervical Cancer* (London: Women's Health Information Centre, undated); and L. Saffron, 'Cervical Cancer — The Politics of Prevention', in O'Sullivan (ed.), op. cit. note 25, 42–49.

36. *Ibid.*, 46.

37. S. Hayman, *The Well Woman Handbook: A Guide For Women Throughout Their Lives* (London: Penguin, 1989), 4–5.

38. Susan Leigh Star, 'Power, Technologies and the Phenomenology of Conventions: On Being Allergic To Onions', in Law (ed.), *A Sociology of Monsters*, op. cit. note 4, 26–56.

39. I have interviewed many lay women who voiced their ambivalent association with the CSP. For example, some women spoke about being a participant, in that they had had a cervical smear test in the past, but also about 'filing' subsequent recalls to have a further test with the intention to attend 'at some time'.

40. Harding, op. cit. note 24, 26.

41. J. Flax, 'Postmodernism and Gender Relations in Feminist Theory', in Nicholson (ed.), op. cit. note 1, 39–62, quote at 48.
42. Nicholson (ed.), op. cit. note 1, 1, 5.
43. For example, see Callon, 'Electric Vehicle', op. cit. note 4.
44. David Harvey, 'Class Relations, Social Justice and the Politics of Difference', in Squires (ed.), op. cit. note 6, 85–120.
45. Ibid., 108.
46. Ibid., 109.
47. Collins & Yearley, op. cit. note 7.
48. Ibid., 32.
49. Callon & Latour, op. cit. note 7, 343.
50. See the texts cited in note 4.
51. Latour, 'The Powers of Association', in Law (ed.), *Power, Action and Belief*, op. cit. note 4, 264–80.
52. Callon & Latour, op. cit. note 7, 344.
53. Star, op. cit. note 38.
54. Callon & Latour, op. cit. note 7, 356.
55. Star, op. cit. note 38, 26; Latour, 'Technology Is Society Made Durable', op. cit. note 4, 103.
56. Ibid., 121.
57. Ibid., 130.
58. Ibid.
59. Ibid.
60. In particular, see Singleton, *Science, Women and Ambivalence*, op. cit. note 3; Singleton, 'Networking Constructions of Gender', op. cit. note 3.
61. Singleton & Michael, 'Actor-Networks and Ambivalence', op. cit. note 3.
62. Latour, 'Technology Is Society Made Durable', op. cit. note 4.
63. Ibid., 126.
64. Harvey, op. cit. note 44, 109.
65. Ibid.
66. Ibid., 117.
67. Ibid.
68. Quotes taken from interviews with lay women. Details in brackets identify the interviewee and date of interview.

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