

Virtual Geographies

Virtual Geographies explores the possibilities and the dangers brought about by the revolution in communication technologies. Outlining how these technologies are being used to produce new geographies and new types of space, this book de-mystifies the hype over 'cyberspace' and its consequences, and reveals how new communication technologies can open up whole new vistas.

Contributors drawn from a wide range of disciplines, including geography, sociology, English and philosophy, investigate how particular visions of cyberspace have been constructed and articulated, exploring the influence of literature, gender, how the experience of online interaction is expressed and of the interest groups or rhetoric that shape many developments. As scepticism of the consequences of cyberspace emerges, the contributors critically assess the status of virtual environments and geographies, how they interact with everyday spaces, and how they can reshape how we think and write about the world.

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Contents

<i>List of illustrations</i>	vii
<i>List of contributors</i>	viii
<i>Acknowledgements</i>	xi

1 Introduction	1
MIKE CRANG, PHIL CRANG AND JON MAY	

PART I	
Embedding the virtual	21

2 Toward the light 'within': optical technologies, spatial metaphors and changing subjectivities	23
KEN HILLIS	

3 The telephone: its social shaping and public negotiation in late nineteenth- and early twentieth-century London	44
JEREMY STEIN	

4 Consumers or workers?: restructuring telecommunications in Aotearoa/New Zealand	63
WENDY LARNER	

5 Transnationalism, technoscience and difference: the analysis of material-semiotic practices	79
LAURA CHERNAIK	

6 The convergence of virtual and actual in the Global Matrix: artificial life, geo-economics and psychogeography	92
OTTO IMKEN	

PART II

Cyberscapes

- | | | |
|----|---|-----|
| 7 | From city space to cyberspace | 107 |
| | JENNIFER S. LIGHT | 109 |
| 8 | Geographies of surveillant simulation | 131 |
| | STEPHEN GRAHAM | |
| 9 | Rural telematics: The Information Society and rural development | 149 |
| | CHRISTOPHER RAY AND HILARY TALBOT | |
| 10 | Internauts and guerrilleros: the Zapatista rebellion in Chiapas, Mexico and its extension into cyberspace | 164 |
| | OLIVER FROEHLING | |
| 11 | Gender and the landscapes of computing in an Internet café | 178 |
| | NINA WAKEFORD | |

PART III

Thinking and writing the virtual 203

- | | | |
|------|--|-----|
| 12 | The virtual realities of technology and fiction: reading William Gibson's cyberspace | 205 |
| | JAMES KNEALE | |
| 13 | On boundfulness: the space of hypertext bodies | 222 |
| | MICHAEL JOYCE | |
| X 14 | Unthinkable complexity? Cyberspace otherwise | 244 |
| | NICK BINGHAM | |
| 15 | Virtual worlds: simulation, suppletion, s(ed)uction and simulacra | 261 |
| | MARCUS A. DOEL AND DAVID B. CLARKE | |

References 284

Index 315

Illustrations

Figures

- | | | |
|------|---|-----|
| 9.1 | Initial relationships of actors and identities | 157 |
| 9.2 | Realignments of actors | 161 |
| 11.1 | NetCafé's location within three landscapes of computing | 181 |

Plate

- | | | |
|-----|---|----|
| 3.1 | The networked city: constructing an underground subway for the Post Office's London Telephone Service, 1901 | 59 |
|-----|---|----|

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5 Transnationalism, technoscience and difference

The analysis of material-semiotic practices

Laura Chernaik

This chapter addresses the relation between technoscience and transnationalism, two of the material-semiotic discourses and practices which interact to produce complex objects and representations. My main concerns, here, are metatheoretical and methodological. I argue that an analysis which focuses on processes of transnationalism and globalisation/localisation alone would be incomplete. So would an analysis that focused solely on technoscience. Our objects of analysis are produced by a multiplex interaction that features transnationalism and technoscience. A successful account has, therefore, to involve both political economy and 'New Science Studies'. We should address both local and global aspects of these discursive practices, such that questions of region too become significant. It is equally important, as I argue in my conclusion, to examine the ways in which in the contemporary period the material-semiotic practices of race, gender, and sexuality act through, and on, technoscience and transnationalism.

My approach to the study of transnationalism is based on neo-marxist political economy, social-history and social and historical geography.¹ I draw heavily on the work of the neo-marxist geographer, David Harvey. Harvey used Regulation School economics as the basis for an extremely useful concept, the 'spatial fix'. The Regulation School is concerned with the social reproduction of capitalism; it analyses the way in which production and consumption are regulated in a regime of accumulation. The modes of regulation include social and ideological formations, institutions and actions. Harvey argues that transnationalism is capital's 'spatial fix' of accumulation's crisis; an addictive, repetitive attempt to use displacement in space to keep the system going. That is, capitalism makes use of spatial displacement – opening up new markets, appropriating raw materials, locating production and design in whatever region or country is cheapest – in order to deal with its recurring crises. It then needs more: another fix or a larger fix.

The 'spatial fix' is a particularly good theoretical concept because it is able to account for several of the characteristics of transnationalism. First, it can account for the way that production is separated into different stages, with design and assembly taking place in different countries. If we take a computer as an example, the circuit boards might be made in South East Asian

maquiladoras, and the software in silicon valley. It can also account for the transition in the developed countries to so-called service-based economies, with shrinking core employment and increasing peripheral employment. There is some question about the key date for this latter transition of the developed countries from manufacturing-based economies to service-sector based economies. Harvey dates it as 'around 1973', that is, when the United States went off the gold standard. That standard had been set in the Bretton Woods agreement at the end of the Second World War. It is therefore possible to argue that the key date for our argument falls much earlier than 1973. In addition, the shift between manufacturing and the service sector is only part of the historical process. Transnationalism and its globalisation/localisation dynamic are conditioned by the histories of colonisation, decolonisation and postcolonialism.

If my approach to transnationalism is based on neo-marxist political economy inflected, as I discuss later, through feminist and postcolonial studies such as Grewal and Kaplan (1994), my approach to the study of technoscience is based on the New Science Studies. There are two major strands to the New Science Studies, a more social-historical approach centred on the work of Donna Haraway and a more anthropological approach centred on the work of Bruno Latour. Both approaches address questions of difference. Where she deals with difference, Haraway's work is concerned with race and gender, as well as class. Latour, however, is more interested in difference as an abstract, almost mathematical concept, than in, for example, gender or sexuality. Haraway and Latour's approach to difference is in turn derived from the work of Gilles Deleuze and Felix Guattari.

The most original, and useful, element in Deleuze and Guattari's philosophy is their development of 'non-particularistic' difference. This notion is in opposition to the way that difference is sometimes conceptualised; in particular, in much political economy. A good example of the 'particularistic' difference that Deleuze and Guattari oppose can be found in a relatively early text by David Harvey (1982), in the introduction to which he makes it clear that he *contrasts* difference to universalisation and the other generalising, abstracting moves that are part of theorisation, as if difference is a counterweight to the 'abstract conceptions' of theory. Harvey's most recent work (Harvey, D. 1996), however, rejects this position, arguing, instead, that difference can be at the heart of theorisation. *A Thousand Plateaus* is the second volume of *Capitalism and Schizophrenia*, both volumes of which were co-written by the philosopher Deleuze and the psychoanalyst Guattari, as were the monographs on Proust and Kafka. Deleuze also wrote, separately, a number of philosophical monographs on Spinoza, Nietzsche, Bergson and other thinkers; however much they might demand of the reader, it is in these philosophical monographs that Deleuze remains closest to traditional philosophical modes of argumentation and logic. Philosophy, like many other disciplines, has dominant traditions – canons of centrally important texts – with their attendant schools, and competing, subaltern traditions. The two

dominant traditions are Anglo-American philosophy and Continental philosophy, each of which breaks down further; thus, Continental philosophy includes, for example, Phenomenology, Kantian and Hegelian philosophies. What makes Deleuze particularly difficult, is that he situates himself outside of all of the major philosophical traditions, as a Spinozan. He even suggests, with some justification, that his work and that of the other philosophers he writes about and by whom he is influenced form an affinity group rather than a philosophical school: they make up a movement rather than a filiation. Or, in Deleuzian terms, philosophical traditions are striated (they are structured, binaristic and metric – that is, measurable) and molar (they are totalities with form and function). As Elizabeth Grosz points out (in Boudas and Olkowski 1994), for Deleuze and Guattari the molar identity is particularistic and difference is universal, is, – or reaches – a plane of consistency. Thus, in *Capitalism and Schizophrenia*, for example, Deleuze and Guattari suggest that classical marxist theory is 'molar' (about totalities) and based on identity (class). So far, the argument is familiar; and, indeed, Deleuze and Guattari move from this point, as one would expect, to a critique of Hegelianism, and its influence on marxism. Many recent critiques of classical marxism focus on its mistaken subsumption of gender, sexuality, and race. It is argued that these analytical concepts are, generically, 'specificities' which classical marxism's logic overlooks, or overcomes. However, Deleuze and Guattari do not oppose gender, race, and sexuality, as 'specificities', to class. They argue, instead, that class-based marxism is about identity; it is therefore particularistic. Class-based theories can therefore *not* be opposed, logically, to theories of specificity. Instead, they claim, there is a way to conceptualise difference as universal – universal in the way that molar theory tries – and fails – to be. This non-particularistic difference or 'plane of consistency' is not transcendent – it is not outside the world. It is found, or more precisely, can be analysed, in the world, in nature. So, molar practices are – or constitute – identities: class, race, gender, sexuality. That is, subjects – psychological subjects (personal identity) and political subjects (political identity). Molar political identities lead to political infighting and fragmentation. So, what alternative do we have? According to Deleuze and Guattari, the alternative to fragmentation is difference and the plane of consistency. Difference and the plane of consistency are not just a matter for subjects: they have to do with, they act in and through, both subjects and objects. For Deleuze and Guattari, rather than 'subjects' perceiving and analysing 'objects', both object and subject are joined in 'affects, subjectless individuations that constitute collective assemblages'. It is this argument about subject and object being joined, not opposed, that is picked up by, and further developed by, the New Science Studies. This new way of thinking about subject and object is useful for anthropological or social-historical studies of science; and, if the scholars concerned wish to use their anthropological or historical approach in a politically motivated critique, the new way of conceiving subject and object provides a sound methodological foundation for the attempt.

However, rather than making explicit the extent to which these reconstituted concepts enable a radically different philosophy of science, Deleuze and Guattari keep their arguments allusive and indirect. They shift back and forth between language, arguments, examples and claims that seem to belong to the philosophy of history, and language, claims, examples and arguments that seem more part of the philosophy of science. This shifting and combination of arguments and discourses is, I grant, frustrating for a reader, but it is, at the same time, this which enables Deleuze and Guattari to make one of their most interesting claims; to have inaugurated a new kind of philosophy, a philosophy of externality. This suggestion is followed up by Elisabeth Grosz in her recent work (1994, 1995a). However, for now, it is enough simply to trace the logic of the argument behind the claim: Both the philosophy of science, and, strictly speaking, the philosophy of history, are, in phenomenological terms, 'intentional', in relation to an object. They are philosophies of externality, rather than of internality. Thus, in their terms, Deleuze and Guattari are philosophers of externality, unlike Hegel, who, in this reading, becomes the philosopher of the State, and in a peculiar way, of interiority (consciousness, thought).

Many of the plateaus, or chapters, of *A Thousand Plateaus* take as their object research in the physical, biological, and social sciences. In each case, the argument is political. Each plateau is used to produce a phenomenological intentionality that is, in Sandoval's terms, an 'oppositional consciousness' (1991), a kind of 'situated knowledge' (Haraway 1991b, 1997), or, in Deleuzian terms, a 'becoming-minoritarian'. As I have said, Deleuze and Guattari's highly allusive style, and tendency to shift, without warning, from one field of study to another, makes it quite difficult to keep track of the argument in each plateau, or to disentangle the political, historical claims from the substantive assertions about scientific facts and biological and geological processes. That is, one may grant that scientific knowledge is produced historically, as what Foucault called 'power/knowledge', but one must still be precise, and distinguish the scope of one's claim. Is it a claim about the production of scientific knowledge; a claim about the production of historical knowledge; or a claim about the production of both kinds of knowledge? In the latter case, one must also decide whether one will argue that the two kinds of knowledge are bound together either ontologically or epistemologically, or are simply linked heuristically in one's argument. Grosz (1994) investigates some of Deleuze and Guattari's scientific claims at length. She shows that 'minority science' or marginal research is not epistemologically different from mainstream work. Whatever one's field of study, whatever one's object of analysis, the knowledge one produces is 'situated', rather than 'free-floating' or 'objective'. This, as Deleuze and Guattari acknowledge, and as the New Science Studies stresses, is what good social and natural scientists do in practice, as well as what many of them argue as theory. Situated knowledges or becomings-minoritarian are not in opposition to universalisation.

For Deleuze and Guattari, as I have explained, difference universalises. It does so, however, not by repeating its identity infinite numbers of times but by 'proceeding to the plane of consistency'. The detailed arguments that provide the groundwork for this idea of non-particularistic, universalising difference belong to yet another philosophical field: that concerned with language and action. Just like Judith Butler (1990, 1993), whose notion of normativeness/deviance is much like Deleuze and Guattari's odd, technical use of the term 'minority', Deleuze and Guattari draw on a theory of performativeness. Deleuze and Guattari use the word 'majority' in a technical, non-numerical sense; a majority, for them, is an identity, a 'state or standard' in relation to which others 'deviate' (Deleuze and Guattari 1987: 291–292). Butler derives her notion of the 'performative' from the philosopher of language, J.L. Austin (1955), who argued that the 'speech-act' was a crucial and neglected aspect of language. Deleuze also draws on Austin, making unexpected connections between his work and that of a much earlier philosopher, the seventeenth-century Spinoza. Deleuze argues that the two most influential contemporary philosophies of language, the first of which analyses language as 'information', and the second of which discusses it in terms of 'connection' or intersubjectivity, are both wrong. Language should, instead, be understood in terms of 'expression', and 'expression' understood as a speech-act, a performative. Rather than content pre-existing, outside expression, expression is a performative, and one, which like Žižek's analysis of retroactive performatives (1993), can produce what it seems to represent. Žižek argues that the process which Lacanians call 'Lack' is retroactively constitutive; the very small child begins to get a sense of itself as a person, a subject, separate from its mother or other primary caregiver, and this 'act' retroactively constitutes a past imaginary unity with the mother, now lost. This is Lack. The thing which Lack loses is the Real: that which hurts, that which one never had, that which only exists in the past, constituted retroactively by oneself, by one's loss of it. What makes Žižek's work so original, and so moving, is that he uses his insight into Lacanianism to analyse one's most painful loves and losses; he shows how Lack becomes the basis not just of love but of hate: nationalism and ethnic hatred, in particular.

The second volume of Deleuze and Guattari's *Capitalism and Schizophrenia*, which is my primary concern here, deals with retroactive constitution, but does not address Lack, *per se* which is dealt with in the first volume. Deleuze and Guattari are greatly troubled by the implications and consequences of the way that we separate and oppose mind and body. The first volume of *Capitalism and Schizophrenia* focuses on mind, addressing Hegelianism and its influence on marxism, and the second volume, which is my concern in this chapter, focuses on body, addressing both scientific and historical discourses and practices. Deleuze is greatly influenced by Spinoza, (this edition, 1955) who came up with a surprising solution to the mind–body problem: there is one substance, infinite and unitary, which has two modes of expression, extension and thought. As Spinoza believed in full space, extension also

means that which is extended: matter. There is no mind-body split, because they are different modes of the same substance. Extension and thought are, in a sense, each one (so that Spinoza verges on a kind of pantheism); they are also multiple, with an infinity of attributes, each creature a mode of these attributes or a modification of substance. Deleuze's notion of performativeness is taken from a key concept of Spinoza, the notion of 'affectio': affections or affects. As Deleuze explains in *Spinoza: Practical Philosophy* (1988b), 'affects' are, first, the modes of substance or its attributes. They then take on, or can be considered at, a second level – as 'that which happens to the mode, the modifications of the mode, the effects of other modes on it.' And third, 'affect' means 'states', 'variations', 'degrees of perfection': transitions from one state, image, or idea to another. The ordinary English meaning of affect, emotion, is very different from Deleuze (or Spinoza's) usage. Deleuze is not writing about interiority at all. Brian Massumi (1992) argues that 'affect', as the term is used in Deleuze's work, is (the body's) 'capacity to affect and be affected, to act and to perceive' (Massumi 1992: 100): closest, I would suggest, to the second meaning of affect Deleuze identifies in Spinoza. It is this second meaning of 'affectio', in Spinoza's work, which Deleuze draws on for his performative theory of language. The third meaning becomes deterritorialised in Deleuze's work, moving into mathematical fields, as 'degrees of freedom', and into physical and musical fields, as 'frequency' and 'resonance', notions drawn on by the New Science Studies. This Spinozan approach to theorisation is also the context from which Deleuze developed his notion of assemblages, or 'abstract machines'.

Deleuze argues that becomings proceed to the 'plane of consistency', to a 'body without organs', by way of 'diagrams' (abstractions, in phenomenological terms), and abstract machines. Deleuze's notion of the abstract machine is reached by means of a critique of the notion of the 'organism', and its associated concept, 'organ'. For Deleuze, 'organism', as a concept, is used to theorise a body as a totality. An organ, similarly, is a discrete part, out of which organisms are made. These are rather old fashioned biological notions; as Deleuze points out, and as Donna Haraway has argued in greater detail, contemporary scientists are more apt to analyse homeostatic mechanisms than organs, and populations than organisms. Deleuze uses the term machine as a move away from these organicist connotations. A machine, for Deleuze, is not just something inorganic. He uses the term in an unusual sense: for Deleuze, a 'machine' is an assemblage of heterogeneous entities: a 'nomad war machine', for example. Haraway, and the scholars influenced by her, call these 'cyborgs': for example, a pilot with a head-mounted display, or a technofeminist scholar.

There are several differences between Deleuzian machines and Harawayan cyborgs. A Deleuzian machine is a *collectivity* made from many entities; the separate entities are from different categories and, in interaction, construct a new way of being and thinking. Their example is a 'nomad war machine': horses, tents, people, collectively a threat to 'sedentary civilisation', to social

stability and stultifying respectability. A contemporary example, for them, would be New Age Travellers: perceived as a threat by the bastions of social stability, living in their vehicles, rather than using them instrumentally. Deleuze and Guattari sympathise, politically, with anarchism, and underestimate the constraints of *Gemeinschafts* (communities) in their rejection of *Gesellschafts* (hierarchical societies). For Haraway, in contrast, the boundary-crossing that makes an *individual* a cyborg means that her identity is 'multiple', that is, non-unitary.

For Stone (1995), the internet is a particularly useful place to explore the multiplicity of identity. Typing at a keyboard, one interacts with someone else typing at a keyboard. Since neither is face-to-face, either can pretend, can take on any 'identity', or can explore his or her own identity in new ways. For Stone, cyberspace becomes an occasion for self-fashioning, and an instance of the performativity that is always at the heart of identity. Play in cyberspace can have real effects. The cyberspace produced by computer scientists and made available for other agents via the internet, and by means of the other cybernetic tools that in our use of them almost become prostheses, is the medium for virtual actions and virtual speech-acts. Deleuze used the word 'virtual' to name the 'unconscious' aspects of language, the nine-tenths of the iceberg; the 'actualised' statements we speak are the tenth part, above the waterline. Deleuze used this trope to suggest that we may be limiting ourselves by dividing ontological states into possible and actual. Actual and virtual might be a better pair of notions. Stone deterritorialises Deleuze's questions about existence and agency, moving them into a new scientific domain, information technology. She is thus able to argue that the virtuality of action and entities, in the internet, is only an extreme case of performativeness.

Stone draws on an aspect of Deleuze and Guattari's work, the theory of performance, expression, and affect, that is closely related to current debates in poststructuralist theory and Continental philosophy.² Donna Haraway and Bruno Latour, however, focus less on the implications of their arguments for Continental philosophy than on developing the aspects of Deleuze and Guattari's arguments that go furthest towards a reformulation, or in some respects, a refoundation, of the study of science. It is for this reason that the approaches are collectively known as New Science Studies. Both focus on questions of difference. They each argue, following Deleuze and Guattari, that difference is not the same as the particular. Latour develops a counter-intuitive but very productive argument about the degree to which the Enlightenment project and modernity have not so much failed as never been properly inaugurated. Haraway draws on Deleuze and Guattari's arguments about performance and performativity, using them as the basis of a radically new way of understanding technoscience and technoscientific practice in terms of action. She goes far beyond her earlier work on feminist cyborgs, and, instead of just concentrating on boundary crossing machine-human hybrids, looks at a much wider range of 'human and non-human actors'.

Both Donna Haraway and Bruno Latour have argued, speaking of two periods when there was a transition between different economic and cultural formations – that is, the seventeenth century and our present period – that there was an interesting and important contradiction between what was said and what was done. In the seventeenth century, as many recent historians of science have argued, there was a lot of rhetoric about the separation of science and politics. The scientific revolution, it was argued, had brought about, or ought to bring about, this separation. Science, and later, social science, would be value-free and the political part of politics could be separated out from a scientific part of politics. This last was eventually known as management, or social policy. As Haraway and Latour both argue, this may have been what people said, but it was certainly not what people did. Rather than these separations, it was actually hybrids that were produced. The hybrids they consider are various – hybrid objects, hybrid subjects and hybrid discourses. Influential New Science Studies texts include, for example Shapin and Schaffer's *Leviathan and the Airpump*, Latour and Woolgar's *Laboratory Life*, Haraway's *Primate Visions* and, as I discuss in this chapter, *Modest-Witness@New-Millennium*. Under hybrid discourse we ought also to include the boundary crossing terminology of so much poststructuralism and postmodernism. However, some of the most troubling criticisms of deconstruction, post-structuralism and postmodernism are targeted at the political implications of anti-humanism or, generally speaking, of anti-enlightenment arguments. Many critics have objected that, whatever the strength of a particular deconstruction of an individual Enlightenment notion or text, there is still a lot that is useful, for politically motivated people – and scholars – in humanism and the Enlightenment. Thus the importance of Haraway and Latour's argument. They argue that, rather than having to be postmodern in a Lyotardian or Baudrillardian way – and therefore having to reject such good as the Enlightenment stood for, along with the bad – we can be amodern. We can argue that the modernity that was called for never really took place, never really arrived.

Thus Latour (1987, 1993), for example, argues that whilst modernity and 'postmodernity' have set up oppositions between the material and the semiotic (for example, science vs. politics, history vs. ideology, the natural and social sciences vs. the humanities) and created large numbers of hybrid discourses and cyborg subjects and formations we have in fact 'never been modern'. The opposition between the material and the semiotic, science and politics defines modernity, and yet, since, in the process, it is hybrids rather than separated discourses and entities that are produced, modernity has, in a way, not yet happened. Modernity has both created 'science' and 'progress', and yet not been modern. It is for this reason that Latour concludes that a thoroughgoing Science Studies would have to call itself 'amodern', rather than 'modern' or 'postmodern'.

Donna Haraway takes this claim further, developing a more detailed historical argument. She also brings in the questions about race, gender and

sexuality which Latour neglects. (Both Latour and Haraway discuss class, although, as I argue in my conclusion, they each move away from the familiar terms of political economy). Discourses, as Donna Haraway (1997) explains, 'are not just "words"; they are material-semiotic practices through which objects of attention and knowing subjects are both constituted' (Haraway 1997: 218). The typography of the phrase, 'material-semiotic', is significant: a dash, not a slash; a relation, rather than a binary opposition. Rather than the 'modern', 'scientific' opposition between subject and object – between, on the one hand, meaning, intentionality, and, on the other hand, history, objectivity, measurability, and universalisability – Haraway draws on Deleuze and Guattari and represents object and subject linked together and transformed, actants in 'material-semiotic practices'.

Haraway moves on from these general points about modernity to a specific claim about the Enlightenment. She suggests that the Enlightenment and Scientific Revolution were far less effective in ending religious master narratives than familiar narratives of progress and science maintain. The material – historical contingency – has shaped what seems most semiotic – and most universalisable – in science and technology. The semiotic – for example, Judeo-Christian figurations, the 'Second Millennium' of Haraway's e-mail address title – has been an irreducible part of modern science. The anthropological studies of scientific labs (Traweek 1988; Latour and Woolgar 1979; Latour 1987, etc.), the social-histories of science and technology (Haraway 1989, 1997; Shapin and Schaffer 1985), both major strands in the New Science Studies, do more than just provide a historical context for truths, the epistemological validity of which depends on a separability from that historical context. Instead, Haraway claims, following Sandra Harding (1992), the epistemological claims (valid, pragmatic, sometimes even life or death claims) of science rest on 'situated knowledges' and 'strong objectivity'.

What interact in 'material-semiotic practices' are not 'subject' and 'object' but 'sticky threads' (Haraway 1997: 68) that can be teased apart by the critic and historian to show 'heterogeneous and continual construction through historically located practice, where the actors are not all human' (Haraway 1997: 68). 'Subject' and 'object' are what used to be called 'reifications', but what now, in her most psychoanalytic argument to date, Haraway calls 'fetishes', 'models' that 'obscure the constitutive tropic nature of themselves and of worlds' (Haraway 1997: 136).

Haraway is drawing here on the work of an extremely influential American philosopher of history and specialist in the early modern period, Hayden White. White argues that, as historians, we need to pay attention to tropes – figures of speech. The American literary critic Kenneth Burke said that there were four tropes: metaphor, metonymy, synecdoche and irony. Metaphors are used to make claims about identity (my love is a rose, Americans are pragmatic); metonymy has to do with relations of part to part (the logic of the example, brand names used as generic terms, etc.); synecdoche figures the

relation of part to whole; and irony is a method of using language in a way that highlights the meanings most different from the literal. Modernity makes subject and object seem things in themselves, non-tropic, non-figurative, self-identical. However, Haraway argues, both subjects and objects really are tropic, figurative. It actually takes a reification to conceptualise something as an object.

So, instead, we can make use of a tropic model, and (re-)conceptualise an 'object' as a non-human actor. Rather than a scientist (a subject) studying an object (a virus), a scientist (a human actor) studies a virus (a non-human actor). Why does this matter? What verb do you use to describe the actions of a virus? Does a virus 'invade' the body, or would another trope be better? If a virus 'invades', a virus is like an enemy soldier, or even worse, like the disguised 'enemy within'. The trope affects how viruses and people with viruses are perceived, which affects funding, which impacts on the production of knowledge. Or, shifting focus in our example, a person 'invaded' by a virus is a 'victim'; a person 'with' a virus is just a person with a virus. The opposition is between, on the one hand, being a 'victim' of AIDS, and, on the other hand, being a person Living With AIDS (a PWA).

We would also focus on 'practices'. Rather than arguing that science 'discovers' knowledge like a 'new-found land', and, often, theorising this process by means of sexual, racial and religious tropes, we would argue that human and non-human actors engage in material-semiotic practices, theorizable in terms of strong objectivity and situated knowledges. Our analysis would be pragmatic and material, and would respect the 'meaningfulness' of the scientific discipline: good science and bad science. It may seem counter-intuitive to think of Boyle's airpump (Haraway 1997; Shapin and Schaffer 1985; Potter, in Haraway 1997), a particle accelerator (Traweek 1988), an oncomouse, that is, a mouse with human breast-cancer genes (Haraway 1997), or a 'DNA labeling kit' (Haraway 1997: 157) as an actor, or actant, but it proves very useful. It means that the practitioners of the New Science Studies can argue a non-relativist position, making strong epistemological and ethical claims. Like the queer theorists who draw on Foucault (Halperin 1995; Bersani 1995), Haraway is able to link together arguments about agency, and arguments about discourse. Even if, as Halperin (1995) argues, the claim³ that a strictly Foucauldian position creates problems for agency is overstated, it is still refreshing to find arguments about agency, and arguments about discourses, combined in such a thoroughgoing way.

Haraway's book begins with an extraordinary first chapter on Robert Boyle's 'modest witness'. She brilliantly analyses the way this trope was used, at the time, to figure, and thus to enable, the grounding of a modern, classed, raced and gendered social order on the set of concepts which became known, and valued, as 'scientific rationality'. Haraway then uses this argument as the basis for a number of original, and explicitly political, detailed studies of contemporary technoscience. She clearly draws upon Deleuzian oppositions, 'machines', and flows:

Nature and Society, animal and man, machine and organism: The terms collapse into each other (Haraway 1997: 120); 'the operating mechanisms, called pragmatics. How do critical theoretical practices deal with the materialised semiotic fields that are technoscientific bodies?' (Haraway 1997: 121)

Haraway has a choice of ways in which to follow Deleuze and Guattari. She can emphasise one aspect of their work, and trace the collapsing terms further and further, into 'becomings' and abstract, pure 'difference'. Or, on the other hand, she can link her analyses of technoscience to the pragmatics⁴ and to the performative theory Deleuze and Guattari touched on in *A Thousand Plateaus*. *Modest-Witness* adopts the second option. In her first chapter on Boyle, Haraway builds on *Leviathan and the Airpump* (Shapin and Schaffer 1985) and the more recent feminist articles on Boyle (Potter, in Haraway 1997; Heath, in Haraway, 1997), developing a theory of actors 'not all of whom are human'. She emphasises the political issues most crucial to the human actors: the oppositions between public and private, and science and politics or ideology. She focuses on the epistemological issues most pertinent to the interactions of human and non-human actors: strong objectivity and democratic technoscience. She thus focuses on difference, but not on 'becomings'. In sympathy with Grosz and Braidotti's critiques of Deleuze and Guattari (both in Boundas and Olkowski 1994), she takes great care to avoid the kind of arguments about pure, abstract difference to which Deleuze and Guattari were led by their deployment of such concepts as 'becoming-woman' and 'becoming-animal'.

The focus on actors and actants, however, links up with something curiously American – myth production. Each chapter is both a detailed, historically based, analysis of a 'material-semiotic object' and a presentation of a myth – an empowering or disempowering narrative about an exemplary figure. Some figures are human actants, ranging from famous scientists to the Jane and John Does of careers guidance booklets. Some are non-human actants, ranging from oncomice – mice with human breast cancer genes – to DNA labeling kits. If White is correct – and I think he is – about narrative and rhetoric in history then Haraway's myth production is just a way of telling different stories – minority histories – of the seventeenth century and the present. She is attempting to produce an alternative genealogy for the present, in order to bring about a more just future. Haraway's rejection of synecdoche – of false universalisation, subsumption, and the hypostatization of a monolithic structure – leads her to adapt a metonymic approach, 'myth production'. However, I am not convinced that myth production is the right answer. It is true that if the only two alternatives are synecdoche and metonymy, then, if we reject synecdoche (subsumptive versions of neo-marxism or feminism) we must choose metonymy (one of many myths, none of them master narratives). But, even if Burke is right that there are four tropes, and White is right about the significance of these tropes to historical analysis,