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Technology and Transformation: Deleuze, Feminism and Cyberspace.

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CONTENTS

ABSTRACT

This thesis examines the theoretical and philosophical aspects of feminist engagements with the cultural politics of technology. It argues that such engagement requires consideration of the frameworks of knowledge through which technology, man and woman are articulated. The early chapters develop a critical account of contemporary understandings of these frameworks, dealing by turn with Heidegger and Foucault. One such framework is identified Luce Irigaray as 'the logic of identity' and is shown to be unacceptable to feminists, on two main grounds: firstly, that it accords woman a merely negative status, defined only in terms of her difference from man; and secondly, that it is conceptually deterministic and cannot therefore allow for the appearance of radically new or different formations. The thesis argues that, to the extent that feminist encounters with cyberspace are articulated through this logic of identity, they can offer no real possibility of transformation. The later chapters show how Deleuze and Guattari elaborate an alternative theoretical horizon within which difference is articulated positively. Detailed analysis of a cyberspace formation, conducted in terms of their concept of assemblage, shows how the radical conceptual shift entailed in their work avoids the limitations of the logic of identity evident in conventional accounts of technology and cyberspace. The thesis concludes that Deleuze and Guattari have developed an open-ended theoretical horizon, which both allows for the possibility of the new and radically transformed and also offers a set of conceptual tools for theorizing technology more consistent with feminist aspirations.

STATEMENT

I declare that this thesis contains no material which has been accepted for the award of any other degree or diploma in any university, and that, to the best of my knowledge\belief, the thesis contains no material previous published or written by another person except when due reference is made in the text.

Dianne Currier

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Introduction:

Theorizing Technology and Transformation

This question of revolution, transformation and radical futures seems to be the unspoken heart of feminist politics: feminist politics cannot see itself except as a form of overcoming and transformation ... the very logic of change, the capacity to initiate a pragmatics of change is central to its formulation as a political and theoretical practice.

Elizabeth Grosz. *Deleuze's Bergson: Duration, the Virtual and a Politics of the Future*

If feminist politics, theorizing and practice are propelled by a transformative impulse, as Elizabeth Grosz suggests, then it is no surprise that the question of technology has attracted increasing attention in feminist scholarship. Whether utopian or dystopian, analyses of technology tend to share a basic assumption that technological development is inevitably a force for change. The intersection of technology with the transformational aspirations of feminism is particularly acute in feminist encounters with the emergent technological and social configurations known collectively as cyberspace. The appearance of cyberspace in the early 1990s was accompanied by a flux of excitement and expectation and, while this has been tempered in recent years, it remains an active site of theorising technologically-transformed futures. Feminism's encounter with cyberspace has generated suspicion and expectation in equal measure: suspicion that the hierarchies and oppressions of the 'real' world are simply being transported into a new arena, or that the new arena itself is little more than a sophisticated and subtle means of extending those hierarchies; expectations that the new configurations of technologies and subjects might shake encrusted hierarchies to the point of breakdown.

Evaluating the impact of technologies and any altered social configurations they might facilitate is a large undertaking with many possible lines of inquiry: from analyses of everyday encounters of women with technological objects, and practices, in the workplace, domestic, and social arenas; to examinations of the discourses and theoretical models which articulate particular understandings of technology, woman and man. This thesis will take up one of these lines, investigating the conceptual basis on which technologies are understood as transformative and assessing the compatibility of such understandings with feminist aspirations. Such an undertaking is not divorced

from the realities of everyday engagements with technologies: it concerns the way technologies, and women's relations to them, are thought and the scope for transformation within that configuration. Thus, while initially propelled by the issue of the transformative possibilities of cyberspace, my focus will be on the understandings of technology that underpin these transformative scenarios, rather than on how various technological configurations and social practices alter the experience and status of individuals within cyberspace. Although oriented around the field of cyberspace, my primary concern will be with the conceptual frameworks within which technology, discourses of transformation and feminist aspirations intersect.

This question of conceptual frameworks, I will argue, is a crucial element of any transformational project. The conceptual categories and frameworks through which particular understandings of technology, woman, man and the relations between them, are elaborated, remain inseparable from any contemplation of technologically-transformed futures. As Grosz argues, to think the new and the radically different requires a conceptual framework capable of so doing. Such a horizon must not be bound by determination, in which all emergent formations are explained in relation to existing ones, but must rather accommodate the "disconcerting idea of *un*predictable transformation, upheavals in directions and arenas which cannot be known in advance and whose results are inherently uncertain" (Grosz. 2000:215). To think radical transformation, then, requires a conceptual horizon that will allow for the emergence of novelty, innovation, or radical change - the new.[1]

If technologies are to be endowed with a transformational potential, then it follows that attention must be paid to the understandings through which such attributes appear.

Close analysis is required to ascertain whether the prevailing conceptual frameworks do indeed allow for the possibility of genuine innovation, or whether they work to reintegrate emerging technologies into the existing arrangements and structures that circumscribe radical change. In order to begin to evaluate the functions and meanings of technologies in everyday practice, and to consider their dangers as well as their transformational possibilities, it therefore becomes necessary to develop an understanding of technology that can account for its very tangible relations to prevailing hierarchical orders, but nonetheless not foreclose the possibility of change. Proceeding from such an understanding enables both suspicions and expectations to be assessed, without one necessarily requiring the surrender of the other. Examining the conceptual frameworks through which technology is articulated will both disclose the extent to which the appearance of the new is possible, and also shed light on how technology is elaborated in relation to man and woman, and the differential nature of those relations.

The first four chapters of this thesis will undertake such an examination. The first section, chapters one and two, begins with the general question of technology. It will seek to move beyond everyday understandings of technologies as tools or machines, in order to discern the conceptual underpinings of such instrumental models. I will examine both the formulations of technology and the configuration and status of the subject within such frameworks. The work of Heidegger, and then Foucault, provides the basis for this analysis, which moves beyond technology to questions of knowledge. Both writers offer sophisticated and convincing accounts of how questions of technology are inseparable from those of knowledge and conceptual frameworks. Both offer explanations of how conceptual horizons function to define, delimit, and sanction particular understandings of technology, those who engage with it, and the nature of

those engagements. In this section, specifically feminist questions will be deferred, in order to explore the relations between formulations of the technological and formulations of Man. However, later analyses of the question of women and technology will be predicated on this initial exploration of man and technology.

While there are substantial differences in their approaches, both Heidegger and Foucault offer means to think technology beyond the everyday orthodoxy of tools or machines. Their work is potentially compatible with feminist accounts of technology, in so far as these latter are interested in the differential relations between men, women and technology, which arise precisely because technology is more than a simple set of tools. In chapter one, I begin with a brief outline of the formulations of technology in feminist theory and then consider these in the light of Heidegger's treatment of the conceptual underpinnings of instrumental and anthropological accounts of technology. It is in Heidegger that questions of man, the subject and modes of knowledge emerge as inextricable from the question of technology.

Foucault is less explicitly concerned with technology than Heidegger, but is interested in how everyday practice is conditioned by epistemological frameworks. In his account of the operations of power, moreover, he offers an explanation sensitive to the multiplicity of everyday practices, without eliding questions of conceptual frameworks and discourse. In chapter two, I will examine one instance where Foucault discusses technology in order to illuminate his account of the relations between practice and discourse. Foucault is equally convinced that man is a product of knowledge and not its source or origin. I want to follow his meditations on the status of man which, while taking us some distance from specific questions of technology, are inextricable from

questions of who encounters technology and under what circumstances. Despite their differences, a consideration of Foucault and Heidegger will yield a general understanding of the central importance of frameworks of knowledge in thinking the relations between technology and man, and hence as a crucial site for feminist intervention.

In the second section of the thesis, chapters three and four, I look at how feminists have identified and taken up this task, beginning with the salient critique of modern man and the conceptual framework through which he is elaborated, offered by Luce Irigaray. She convincingly demonstrates that one of the most pervasive of such frameworks, the logic of identity and the associated structure of binary opposition, is detrimental to woman. 'Difference' feminism has given a lucid account of the exclusionary and oppressive nature of the binary opposition as an epistemological structure through which sexual difference is articulated.[2] Grosz provides a concise summation of its operations:

> Dichotomous thinking necessarily hierarchises and ranks the two polarized terms so that one becomes the privileged term and the other its suppressed, subordinated negative counterpart. The subordinated term is merely the negation or denial, the absence or privation of the primary term, its fall from grace; the primary term defines itself by expelling its other and in the process establishes its own boundary and border to create an identity for itself. (1994:3)

Identity is articulated through a movement of expulsion of the other, in which that other is only ever conceptualised in terms dictated by the predominant term. Within such an economy of identity, difference is conceptualised only in terms of degree of difference from the privileged term - as diminution, variation or lack. The specificity of the secondary term, its difference in and of itself, is unable to be accounted for autonomously, it is always only described in relation to the first - in its difference *from*

it. This logic of identity is then a logic of sameness, which casts difference only in terms of a relation to a central identity that is itself determined through this process.

In chapters three and four, I track this logic through the discourses of information technology and cyberspace and examine how feminists have identified it as a key site of challenge, but equally how this logic infuses a significant number of conceptual models of technology and cyberspace. I explore the way this logic intersects with feminist accounts of cyberspace and how feminist formulations of transformation encounter and respond to it. In chapter three, I examine the question of woman and technology: firstly via Irigaray's situating the question of woman and logic of identity as crucial to any feminist transformational project; and then through an analysis of two contemporary feminist theorists of technology, Donna Haraway and Sadie Plant, examine how information technologies are positioned as a productive site of disruption to the structure of the binary. Through an assessment of Haraway's and Plant's insights and shortcomings, it becomes possible to identify the persistent difficulties and blockages posed by such structures and to identify the points at which more effective challenges need to be directed.

In chapter four, I will bring these issues to bear on the question of cyberspace by tracking the formulations of technology and woman that predominate in the transformational discourses of this sphere. The decision to focus on the transformational, rather than on those accounts which investigate the dangers and limitations of cyberspace, stems from a discomfort at the enthusiastic claims of ready transformation which surround cyberspace. Such transformational discourses herald the dawn of a new information age in which the difficulties of institutionalised sexual

inequity will dissolve in the flux of information. Even those who are more guarded in their evaluation of these technologies seem convinced that cyberspace represents a major break with, or challenge to, the prevailing technological and epistemological order - and that this break could indeed signal a field of liberation for women.

I want to examine transformational accounts of cyberspace in order to explore the degree to which their understandings of technologies and modes of engagement are reliant upon or contained within the logic of identity. From this it will be possible to make an assessment of whether, and in what manner, the persistence of these epistemological structures works to undermine the transformational possibilities identified by feminists for cyberspace. I want to orient this assessment around the question of how bodies are theorized in relation to emerging technological configurations. Bodies provide a useful focal point for a number of reasons: firstly, they are active and undeniable sites of difference and, importantly, of sexual difference; secondly, they are an important site of the social articulation of subjectivity; thirdly, in so far as bodies are volatile and excessive, they stress those social structures that articulate subjectivity, giving rise to the possibility of transformation; and finally, they are material points of contact with technological objects. It is as a site of irreducible difference, volatility and also malleability that I want to position bodies, as a way of bringing the question of difference to bear in an examination of the discourses of cyberspace. Thus, while in the main I do not explicitly address the question of sexual difference, it remains implicit in my investigation of questions of technology and transformation. By mapping the ways in which bodies are articulated in the discourses of cyberspace, we can discern how difference and identity intersect in those discourses and track their implications for transformative projects.

Difference emerges as a crucial concept in transforming the configurations and articulations of woman. Irigaray has demonstrated that, within the epistemological framework of identity, or sameness, difference is figured only as difference of degree. This formulation effectively obliterates autonomous difference and so, when woman is thought within this framework as the opposite of man, her specificity is denied. Moreover, as long as difference is always conceived in relation to the same, the possibility of the radically different - the genuinely new - is foreclosed. What we require, then, is another set of concepts, another epistemological horizon, through which difference can be articulated other than as lack, negativity, or diminution of the same. In the final section of the thesis, chapters five and six, I turn to Deleuze and Guattari, in order to pursue such a theoretical shift, whereby the logic of identity no longer functions as the conceptual horizon within which technologies, bodies, man and woman are articulated. Deleuze and Guattari make a radical departure from the framework of identity in their quest to affirm difference as other than lack and divergence. Chapter five draws on a number of their concepts - assemblage, virtual, actual, difference in kind, events and becoming - to explore modes of thinking bodies and technologies other than through the binary logic of identity. Chapter six offers an analysis of a cyberspace assemblage in order to demonstrate the very different understanding that emerges when such a practice is apprehended through a Deleuzian conceptual horizon.

The concluding chapter examines the scope of the theoretical shift Deleuze and Guattari facilitate and consider its implications for how we approach the emerging formations of cyberspace and, more generally, for feminist understandings of and

engagements with technology. While much of the early giddy enthusiasm for virtual futures has been tempered by methodical scholarship and rapidly increasing commercial and governmental intervention into the internet, expectations of radical transformation persist. Clearly it is beyond the scope of the thesis to predict what forms of transformation might occur. What I hope to do is to begin to develop the necessary conceptual tools and strategies through which feminists can reassess the intersections between women and technology so that transformation becomes at least a possibility.

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[1] Grosz is principally interested in the question of the emergence of the new in terms of theorizing time. However her general point that the possibility of the emergence of the new and radically different requires a conceptual horizon not bound by determination is equally salient in the context of examining the conceptual frameworks through which technology as transformative is articulated.

[2] For a broad introduction to corporeal feminism and the problematic of binary logic see: Luce Irigaray (1985) *Speculum of the Other Woman*; Elizabeth Grosz (1994) *Volatile Bodies. Toward a Corporeal Feminism*; and Vicki Kirby (1997) *Telling Flesh. The Substance of the Corporeal.*

Chapter 1

Technology and Man

The meaning of technology hides itself.

Martin Heidegger. *Discourse on Thinking*

Implicit in feminist investigations of technology is the assumption that technology is more than a simple set of objects, tools or machines equally at the disposal of all users, but rather that it is enmeshed in the field of differential relations between men and women. Theoretical accounts of the status and function of technologies in these relations vary greatly across the range of feminist thought. Keith Grint and Rosalind Gill, in their introduction to the collection of essays *The Gender Technology Relation,* distinguish three predominant schools of feminist thought on technology: eco-feminism, liberal feminism and technology as masculine culture.[1] All three are concerned with the relation between technology and masculine power, but they offer different and often incompatible explanations of how these are aligned. My interest here is not principally in recounting the conflicts and concurrences between these formulations of the technology/masculinity relationship, but rather to gain a general sense of the basic model of technology from which they each proceed. Grint and Gill's first two categories, eco-feminism and liberal feminism, reflect commonplace understandings of technology, respectively those of technological determinism and instrumental neutrality. The third category, technology as masculine culture, attempts to complicate these two approaches, but I would argue that a brief examination of all three reveals a shared basic conceptual model of technology as instrumental. It is to this model that I want to turn my attention, in order to assess its implications in terms of the larger question propelling this thesis, that of the transformative possibilities of technology.

Eco-feminism is characterised by a fundamental suspicion of technology, in so far as technology is seen as belonging to the techno-industrial assault on nature. Women are understood to be attuned to nature, in large part as a result of their maternal capacity. men to the industrial. In the discourses of eco-feminism, technology is understood in

entirely determinist terms, so that technologies belong to the masculine order and necessarily embody its aims, operating simply to extend the masculine project of exploitation and domination. (Rothschild 1983, Marchant 1980, Stabile 1994) Women should thus have no truck with technology in so far as it exists only to exploit and dominate. This is clearly an instrumental, as well as determinist, understanding of technology. Technology is here a tool used by patriarchy to serve its interests. Moreover, technological objects are themselves imbued with the qualities of patriarchy and are thus generally inimical to women.

Liberal or equality feminism refuses the essentialist underpinnings of eco-feminism, holding that men and women belong equally to a generalised humanity and that inequities are established and maintained within the social sphere. In contrast to the deterministic view of technology in eco-feminism, liberal feminism understands technology principally as a neutral set of tools, which simply serve the interests of their possessors. (Spender 1995, Stanley 1998, Oblepias-Ramos 1998) According to liberal feminism, technology is currently possessed and operated by men so as to sustain their position of domination, and must be appropriated by women in order to relieve them of their own subordinate position. Technologies are instruments which confer benefits on those who possess and control them and so liberal feminism is concerned with questions of access and expertise in regards to women and technology. Again, technologies are instruments to be used by interested parties, but in this instance they are initially neutral and have no determining function.

The third school of feminist thought, the social constructivist account, which sees technology as 'masculine culture', disputes mere possession as sufficient to explain the

relation between technology and masculinity and is concerned to examine the processes through which technology becomes associated with and defined as masculine.[2] The determinism of eco-feminism is considered problematic in so far as it is based on essentialist assumptions about women and nature (Grint & Gill 1995:5). Essentialism is here entirely unacceptable in thinking the status of women since it restricts them by delimiting certain essential characteristics as their only way of being, so that women become defined by their sexual and reproductive capacities (5). Moreover the qualities attributed to women within eco-feminism, such as nurturance and pacifism, are, according to social constructionism, precisely those which the prevailing hierarchies determine to be feminine.

Social constructivist feminism is highly critical of equality feminism in so far as it sets man as the norm, to which women must 'catch up' through increased access to technology in this instance. To the extent that liberal feminism proposes an unproblematic instrumental neutrality as the basis for men and women's engagement with technology it is seen as offering no avenue by which to account for the complex relations between technology and masculinity. Indeed, it has difficulty in moving beyond a superficial account of the formulation of masculine or feminine social subjectivities, in which these are seen as formed by gender stereotypes simply being overlaid onto undifferentiated humans. For constructivist feminists, such accounts of 'gendered identity' rest on overly simplistic understandings of the mechanisms of power and cannot explain the complex relations between identity construction and social inequity (6).

Constructivist feminism is concerned to investigate the ways in which social institutions and practices give rise to and proliferate masculine and feminine identities which are unequal. Their investigations of technology are concerned with how it intersects with masculine and feminine identities within the social field. In doing so they attempt to move beyond an understanding of technology as either deterministic or essentially neutral:

> During the eighties, feminists have begun to focus on the gendered character of technology itself. Rather than asking how women could be more equitably treated within and by a neutral technology, many feminists now argue that Western technology itself embodies patriarchal values. (Wajcman 1991:17)

This approach seeks to discover how the alignments of masculinity and technology are materialised and how they operate across everyday practice as well as in the social construction of gendered identities. There are, of course, variations in constructivist approach, both in theoretical framework and in the specific mechanisms they identify as aligning masculinity and technology. I am not overly concerned with the details of these divergences. Rather I wish to take the shared understanding of gendered subjectivity as social construct and track the understanding of technology which emerges alongside it. Cockburn sees the two as inextricable:

> Feminists claim that the social relations of technology are gendered relations, that technology enters into gender identity, and... that technology itself cannot be fully understood without reference to gender. (Cockburn 1992:32)

Gender, in the sense of the social construction of identity as masculine and feminine, and the associated attachment of specific social status and role to that identity, is the conceptual cornerstone of constructivist approaches to technology as 'masculine culture'. Constructivist feminists are interested in the manner in which both the

discourses of technology and everyday material interactions with it are linked to the articulation of masculine identities and alienated from feminine identities. Through this linkage technology becomes marked as the domain of the masculine and the masculine marked as the domain of the technological. Women thus occupy a peripheral position in this process of double articulation, whereby technology comes to embody masculine power and masculinity comes to be technologised in its constitution:

> women's alienation from technology is a product of the historical and cultural construction of technology as masculine. Masculinity and technology are conceived as being symbolically intertwined, such that technical competence has come to constitute an integral part of masculine gender identity, and, conversely, a particular idea of masculinity has become central to our very definition of technology. (Grint & Gill 1995:8)

Grint and Gill raise the issue of where feminist intervention into the relations between men and technology should best be focused. In their consideration of some of the unresolved problems of constructivist accounts they raise the question of 'what propels these historical and cultural processes through which technology and masculinity are aligned?' They argue that, if constructivism is to problematise the instrumental neutrality of liberal feminism, then a distinction is necessary between the everyday actions of men and the social arrangements of power which serve men's collective interest:

> Technologies ... are *gendered.* As a result of the context or culture of their production they come to embody particular assumptions about social relations, to embody 'patriarchal values'. (Wacjman quoted in Grint & Gill 10)

Patriarchy as deployed in constructivist accounts assumes the status of a 'masculine ideology', which shapes social practices and social identity and forms the framework through which technology and masculinity are interlinked (13). A distinction between

men and patriarchy is therefore deemed necessary, in so far as it short circuits any simplistic instrumental model whereby individual men are possessed of a conscious affinity with technology and actively make use of it to further their own interests. Rather, it becomes a question of how patriarchy as a set of power relations serving the interests of men is distributed across the social and cultural, infusing the everyday activities of men, installing a particular version of masculinity, and conditioning men's engagements with technologies in various institutional contexts. It is patriarchy which generates the technology-masculinity circuit. The everyday interactions between men and technologies remain therefore symptomatic of the operations of patriarchy as an ideology and feminist intervention must move beyond them to address the underlying ideological framework.

Social constructivist accounts of technology and its relation to men and women attempt to refuse both the simplistic instrumental neutrality of liberal feminism and the technological determinism of eco-feminism. Technologies are thus seen as over-coded through a variety of mechanisms or practices, as "bearing the imprimatur of their social context" (Karph 1987:62). This notion of technology, inscribed by the social and functioning in accordance with those inscriptions, is a central tenet of the 'technology as masculine culture' school of thought. It is on this basis that the social becomes the field in which technologies find their meanings, where identities are constituted and where the relations between the two are established and mobilised. However, while dismissing the liberal feminist notion of technological neutrality as naïve this model of 'over-coding' remains premised on a certain implicit instrumental neutrality. In so far as technological objects gain their meanings and functions from social deployment, it is implied that prior to that deployment they are essentially neutral and available for

inscription, interpretation or 'overcoding'. Moreover the manner of their deployment in the social is seen as determined by whoever is served best by the power relations that structure this social. Thus masculine culture, to the extent that it delivers power to men, is the mechanism which over-codes initially neutral technological objects, and deploys them in an instrumental manner, as tools, to establish and maintain the interests of men.[3]

Across a range of feminist theorizing, then, a particular formulation of technology persists, based on the instrumental model of a set of tools and objects, processes and practices, used to serve the interest of those in power. I will return to feminist responses to this model, particularly those made by post-modern or cyborg feminism, later in the thesis. But before undertaking this task we need to examine in more detail the conceptual framework that supports this model of technological instrumentality. It is not a question of reaching the 'truth' about technology by delving beyond social manifestation to essence, but rather of examining the relation between technology and conceptual frameworks, discovering how that relation conditions particular understandings of technology, its users, and the relation between the two. In this and the next chapter I will argue that such an exercise is an unavoidable attendant to questions of the transformational potential of technology.

One of the most sustained meditations on the conceptual underpinnings and inadequacies of the instrumental model of technology is that offered by Martin Heidegger. In his examination of the formulation of such instrumental understandings he radically reframes the question of technology and positions it as inseparable from the question of knowledge. Heidegger never addresses himself to the question of men and women's differential relations with technology, but rather investigates the question in

terms of a generalised human.[4] In examining Heidegger's response to the question of technology and man, I want to temporarily suspend direct investigation of the question of woman and technology. I will return to this question in the next section of the thesis, but here I want to explore the question of how relations between technologies and man are conditioned through the categories and frameworks of knowledge that give rise to particular configurations of both. While this might appear tangential to the issue of the everyday practices and encounters of women with technologies, I would argue that this conjunction is valuable for feminists, since it concerns the formation and status of subjects and their relations to technological objects.

I want to focus on two Heidegger essays: 'The Question Concerning Technology', in which he firmly fixes the question of technology, in modernity, as inseparable from questions of knowledge and man; and 'Modern Science, Metaphysics and Mathematics', which explores the relation between modern subjectivity and frameworks of knowledge. While this reading will take me some distance from technology, it intersects with feminist questions in terms of unpacking the conceptual structures within which technologies are formulated as a set of objects in a particular relation to man as subject. In both essays, Heidegger explains that man and technology are social and historical configurations; further, that across the social field it is possible to discern the prevailing framework of knowledge and founding concepts which function as the basis on which man and technology are rendered intelligible, and which structure the scope and nature of their interactions. It is in this context that we should read Heidegger's description of modernity as a technological age. Modernity marks not only the intensification of the development and spread of technology and the arrival of the 'atomic age', but also the emergence of a particular mode of knowledge. When referring to modernity I will,

following Heidegger, take it to refer to the arrival of a specifically modern mode of knowledge, which constitutes and structures our understandings of nature, man, technology, world and the scope of their interactions.

While both essays are later works, concerned explicitly with science and technology, they are also obviously informed by the inquiry into the nature of Being which propelled Heidegger's earlier work. However they take a different approach towards thinking the relations between technology and man from pure metaphysics. In his introduction to Heidegger's *Discourse on Thinking* (1966) Anderson notes a shift in emphasis in the later work. He claims that, whereas in *Being and Time* (1927) the defining character of man's nature had been understood as a transcendental structure of experience, in his later work Heidegger conceived this character as "the way in which man is involved immediately and directly in being" (1966:21/22). This marks a shift from man as central, as the being through which Being can be thought, to Being and man being in a relation, the relation itself being that which requires analysis to understand the nature of Being. In the latter approach, man is no longer the privileged site. Heidegger's later approach to the question of Being is directed towards analysing how phenomena present themselves within an age. In this later work, the individual subject is subservient to the mode in which Being reveals the world (Cooper. 1997:53), whilst in the earlier works the being of man was the place where Being revealed itself – a view consistent with a metaphysics of the subject. Thus, in the conversation which comprises the second part of the *Discourse on Thinking*, when the scientist questions the teacher's claim that "the question concerning man's nature is not a question of man" (Heidegger. 1966:58), Anderson finds "a suggestion that to comprehend man one must transcend the specifically and merely human, the subjective" (22). I am not concerned here with the

itinerary of this shift, in terms of its consequences for Heidegger's conceptualising of Being, but rather with following its anti-subjective movement as a basis for explaining the intersection between the question of the status of man and that of technology. This de-centering of the subject is crucial, not only to Heidegger's account of technology, but also to his consideration of the operations of knowledge. Moreover, it offers an immediate complication of the instrumental model of technology in which subjects (individually or collectively) use technological objects.

The move toward de-centering the subject is reflected in the general claim Heidegger wishes to make about technology: that the instrumental account cannot account for its status, effects, and relation to Man. Consequently, in order to understand the nature of technology, technological artifacts and practices must never be the sole, or even principal, site of investigation. Indeed, for Heidegger, focusing on the technological artifact, while of interest, can actually work to obscure the more fundamental workings of technology and thus to obscure what he sees as the grave threat technology brings. In keeping with this approach throughout this chapter discussion of specific technologies will be minimal, which is not to propose that they are only of peripheral concern. As we shall see to investigate technology is, for Heidegger, to always already investigate the question of man, while any investigation of man, or the subject, is at once a consideration of the objects, social contexts, and frameworks of knowledge within which the technological is constituted. Such a strategy will intersect with feminist concerns in so far as analyses of technologies which aim to discern their relations with men, and women, must also concern themselves with the way those objects and subjects, and the relations between them, are elaborated on a number of levels, including that of knowledge.

Technological Man

In 'The Question Concerning Technology', Heidegger seeks to uncover the relationship between man and technology. In order to accomplish this, he insists that we look beyond the technological artifact to discover the 'essence' of technology.[5] He inquires into this essence to discover on what basis man engages with it, and further to trace how this engagement is played out in the operations of technological artifacts and man's interaction with them. For Heidegger, it is only at the level of essence that we can fully understand the relation of man to technology. The term essence is used in a very particular way by Heidegger. It is taken up in the more conventional sense of a universal quality - the treeness of a tree - but also in the sense of truth. He wants to discover the 'truth' about technology, and that truth is to be discerned by examining what it does: how technology functions in terms of the revealing, or coming into appearance of things. This is, of course, an adjunct to his wider investigation of Being which, while not the principal concern of this project, will nonetheless shadow any account of Heidegger's formulation of the essence of technology. I am interested in how Heidegger's pursuit of 'essence' shows how an instrumental account of technology opens onto questions of knowledge. In this pursuit of essence, Heidegger makes a first move away from the objects themselves and marks the question of technology as more generally one of ways of knowing.

For Heidegger, instrumentality presents one of the chief obstacles to arriving at a 'true' understanding of technology. He is clear from the outset that the essence of technology is neither determined nor located in the operations and functioning of any particular technological apparatus or system:

> The manufacture and utilization of equipment, tools and machines, the manufactured and used things themselves, and the needs and ends that they serve, all belong to what technology is. The whole complex of these contrivances is technology; technology is itself a contrivance ... the essence of technology is by no means anything technological (1993a:312)

For Heidegger, any appraisal which focuses on the technological object will rely on an understanding of technology as both instrumental and anthropological, the former holding that technologies are simply technical means to ends, and the latter signalling that these technological means serve human ends. While not denying that there is indeed an instrumental and anthropological dimension of the technological, Heidegger believes that, if investigations remain content with this merely 'correct' explanation, they will fail to grasp the essence of technology and thus fail to understand the 'truth' of technology and of man's relationship with it. He delineates two distinct levels of inquiry, the first concerning the everyday operations of technological objects and practices, the second that of technology and knowledge. While he does not dismiss the first as entirely invalid, he is adamant that without an investigation of the second, understanding is bound to remain partial, superficial and even misleading, to the extent that it prevents further consideration of the second level.

In order to move beyond instrumental and anthropological explanations of technology, Heidegger begins by exploring the conceptual foundations of the notion of instrumentality. He finds that instrumentality turns on a simplistic understanding of causality which he seeks to complicate. For Heidegger, the notion of cause can be traced back to classical Greek thought, where it presents itself as not only the means of effecting or bringing about an end, but also being that to which something else is indebted in the sense of responsibility. In this light, causes are ways of being

responsible for the "thing which is lying before us ... they bring something into appearance, they let it come forth" (316). This bringing forth, Heidegger describes as a 'revealing' in which "bringing-forth brings out of concealment into unconcealment" (318). Revealing, for Heidegger, is the basis on which the actual presents itself and becomes known and knowable to man. Revealing, then, is the process whereby a thing is revealed as the thing that it is: it is thus a constitutive and productive act. To the extent that as instrument it belongs to the order of causality, technology is characterised by a movement of bringing-forth: "Technology is a way of revealing" (318). In this register, technology does not refer to tools and machines, but rather describes a way of revealing, that is, a mechanism for apprehending the world, a particular mode of knowing the world.

For Heidegger, there are various modes of knowing (revealing), and technology belongs to one of these: *techne*. *Techne* is not simply shorthand for the technological, indeed one of its chief characteristics is that it is not restricted to the technological, but belongs more generally to all spheres of human endeavour. This is an important point, in so far as it implies from the outset that technology at this level of knowledge is inextricably bound to questions of man, a point Heidegger explores in great detail. As a particular way of knowing, *techne* is characterised by being "entirely at home in something, to understand, to be expert" (318). Such knowing is a movement of revealing, of opening something up to knowledge. Heidegger contrasts it to the radically different mode of revealing of *poiesis*, which reveals through a bringing-forth that allows the concealed to come into unconcealment under its own impetus. *Techne*, on the other hand, is more interventionist, it "reveals whatever does not bring itself forth, and does not yet lie before us, whatever can look and turn out now one way and now anther" (319). *Techne*

is not simply an observational detached knowledge, which describes the being and operations of a thing as it reveals itself, but rather it is a creative and productive knowledge:

> For technology does not go back to the techne of the Greeks in name only but derives historically and essentially from *techne* as a mode of *aletheuein*, a mode, that is, of rendering beings manifest. (Heidegger 1993c:244)

It is the particular manner of revealing, characteristic of *techne,* that illuminates the essence of technology. Underpinning the model of instrumental means and human ends, Heidegger finds the operations of a particular mode of knowledge, which he then takes as the basis for developing an alternative explanation of the operation of technologies and their relation to man.

Fundamental to this explanation is Heidegger's contention that the mode of revealing of *techne*, operational in modern technology, is that of challenging-forth, a "challenging, which puts to nature the unreasonable demand that it supply energy which can be extracted and stored as such" (1993a:320). He sees this as a way of 'setting-in-order', which works upon nature: for example, "air is set upon to yield nitrogen, earth to yield ore, ore to yield uranium and uranium set upon to yield atomic energy" (320). Technologies are not simply instruments that facilitate this extraction of energy from nature, but rather they are constituted on an understanding of the world as a reserve of energy, which must be unlocked, extracted, stored and exploited. This is not a purely economic imperative, but rather it emerges as the mode of knowledge that frames our understanding of the world, and which underpins any instrumental function of technologies. This ordering is what is obscured when the instrumental is taken as the

entire explanation of technology. Heidegger gives the example of an airliner standing on a runway, which at the instrumental level can be understood as a conglomeration of technologies that carry out certain functions such as flying. However, if this is the only level on which it is described, "it conceals itself as to what and how it is. Revealed it stands on the taxi strip only as standing-reserve, inasmuch as it is ordered to insure the possibility of transportation" (322).

Transportation is not only tied to tangible arrangements of power and economy which order the movement of populations and the circulation of money and goods, but is underpinned itself by the mode of knowledge that orders the world's resources and energies. Heidegger thus finds that technological objects and processes are embedded in wider social and economic contexts, and, more fundamentally, that 'technology' operates as a mode of knowing and ordering the world. While the deployment and use of technologies works on the 'natural' world so as to bring it under the dominance of man, 'technology' operates as a mode of knowledge to 'enframe' that world. Heidegger terms this enframing, the *Ge-stell*. This enframing seeks to organise nature (the world) into a 'standing-reserve', to place all the resources and energies of nature as permanently available to be called into the service of humanity:

> Everywhere, everything is ordered to stand by, to be immediately on hand, indeed to stand there so that it may be on call for further ordering. Whatever is ordered about in this way has its own standing. We call it the standing-reserve. (322)

The ordering into standing-reserve marks nature as readily knowable, quantified and commodified, so that objects have meaning only in terms of their energy and resource

value. The challenging forth, or revealing, of the world which technology constitutes, is the establishment of this order.

Having established that the instrumental model of technology is underpinned by the operations of a particular mode of knowledge which can be traced back through the operations of causality, Heidegger turns to the anthropological aspect of the means/ends equation. For feminists this too is a crucial step, as feminist investigations of technology, whatever their position, are equally interested in investigating the relations between men, women, and technology. Heidegger might not explore this question in terms of differential relations between men, women and technology, but in so far as he embeds the question of man into the question of technology, he ensures that a consideration of man is unavoidable in every analysis of technology and, with it, for feminists, the question of woman. To the extent that the standing-reserve is the organisation of nature into a state of availability for man's use, man would seem to be the originator of the enframing. However, he claims that man is equally enframed because the framework of knowledge, the *Ge-stell*, which orders nature as standing-reserve, also constitutes man as standing-reserve:

> Enframing means the gathering together of the setting-upon that sets upon man, i.e., challenges him forth, to reveal the actual, in the mode of ordering, as standing reserve. Enframing means the way of revealing that holds sway in the essence of modern technology and that is itself nothing technological. (325)

The enframing of nature is not simply a means by which man establishes his order over the world; it is a particular system of knowledge and order in which he is equally immersed. That man is deeply embedded in technology, as are technological objects, is not simply an issue of the logistics of the material arrangements and distribution of that

relationship. When Heidegger states that we are everywhere unfree and chained to technology it is not at the level of the machine or artifact that this relation of unfreedom is established, rather it is in the essence of technology. Man is enmeshed inextricably in the operations of the particular mode of knowledge that marks technology, indeed literally *isn't* outside them: it is only through being subject to the same process of ordering, of revealing, that he recognises himself. This is not to claim in any simplistic way that man is a technological object: there remains for Heidegger a very clear distinction between man and machine. But it is through the movements of revealing of the *Ge-stell*, of technology, that he *is*, that he finds himself as himself, that he knows himself. Thus, in keeping with his general de-centering of the subject, man is not possessed of agency in terms of technology. Rather, for Heidegger, the two are closely and complexly linked in the moment of revealing as a mode of knowledge characterised by a challenging-forth. In revealing, man and technology find their shared modes of organisation and constitution. Further, in understanding the nature of man and technology, an instrumental and anthropological understanding is possible only when the shared movement of revealing is concealed and the true nature of the technology, that is as *Ge-stell*, denied by asserting man's mastery over the machine.

In *Identity and Difference*, we also find a rejection of simple technological instrumentality, underpinned by the more general movement away from a metaphysics of subjectivity. Heidegger asks whence this framing of the world as calculable comes - from man, from nature, or from Being itself - and finds that all three are equally challenged by it. Being itself - that is things as they are unconcealed - is ordered by the operations of the framework which 'sets-upon' nature in order to calculate and store. It is only through the operations of particular modes of knowledge that technologies,

humans, and the objects and entities of the world come to be apprehended, rather than through the appearance of their essential truth:

> Is it that Being itself is faced with the challenge of letting beings appear within the horizon of what is calculable? Indeed. And not only this. To the same degree that Being is challenged, man, too, is challenged, that is, forced to secure all beings that are his concern as the substance for his planning and calculating; and to carry this manipulation on past all bounds. The name for the gathering of this challenge which places man and Being face to face in such a way that they challenge each other by turns is "the framework". (1969:35)

If we understand the movement of this challenging, this mode of revealing, as the operations of a particular mode of knowledge - *techne* - then we can see the constitutive operations of knowledge as a crucial site for exploring the relations between man and technology. Irrespective of Heidegger's particular characterisation of the framework of knowledge, in so far as he directs attention to the constitutive operations of knowledge in terms of elaborating relations between man and technology, his analysis suggests to feminists an important site for investigation in their analyses of technology.

Technological Neutrality and Determinism

If Heidegger repositions instrumentality as merely correct rather than the 'truth' of technology, then clearly his account has consequences for the two prevailing figures in general technological discourse. A model of instrumental neutrality clearly cannot be sustained since Heidegger has demonstrated that every artifact is constituted within a particular epistemological framework, which organises the world in particular ways. Heidegger is not so much concerned with the specifics of the political and social hierarchies that benefit from this organisation, though he does refer in passing to the links between the standing-reserve and global economics, population dispersal and

geographic ordering. Irrespective of the particularities of these social and political linkages, it is clear that the notion of neutrality is untenable, and that "seen in terms of standing-reserve the machine is completely nonautonomous" (1993a:323). To the extent that technologies and machines are always already articulated through technology, as a mode of knowledge, it is impossible for them to have any prior neutral status. Technologies, then, are not characterised by mere instrumentality - that is, they don't simply function according to the independent will of the user - rather they are fundamentally ordered by prevailing systems of knowledge, and thus never neutral.

As for technological determinism, for Heidegger it cannot be a question of technological devices or systems determining human behaviour or conditions. Such explanations fail to account for the frameworks of knowledge that establish the field within which any technological object can be conceived and through which man encounters those technologies. Man's interactions with technology, for Heidegger, are not determined in contact with technological objects, but through the horizon of knowledge through which he is articulated and ordered. Technological artifacts and processes are likewise articulated within that horizon, such that any prior determination, which they might then impose on man, is clearly impossible.

This refusal of technological objects as determining does not, however, defuse the question of determinism altogether. The difficulty in establishing the essence of technology as distinctly untechnological and thereby embedding it into broader social and cultural formations, relations of power and structures of knowledge, is that it suggests a more fundamental determinism whereby each artifact is constituted with an already given meaning and function, and any encounter with it or any outcome of its

operations will, likewise, be predetermined within that matrix. Such a deterministic account represents a closed system, whereby technologies, and humans, are always articulated within the confines of a particular social configuration or through an overarching framework of knowledge. While it might appear to explain prevailing relations, the possibility of transformation is nonetheless severely curtailed, to the extent that those relations are entirely elaborated through and contained within the framework. To what extent, then, does Heidegger present us with a deterministic paradigm? Does the refusal of an ontological neutrality automatically install a determinism, whereby every artifact and object, every manufacturing, construction and dispersal activity is motivated and deployed according to and in the service of a determining essence? There is undoubtedly a certain determinism at work in Heidegger's account of the *Ge-stell*, but to the extent that it marks it as just one particular mode of knowing, he does not close down entirely the possibility of others or of change. Again, this is a salient point for feminist theorizing of technology and transformation. It suggests that the re-orienting of technologies will require a shift in the frameworks of knowledge through which they are apprehended and understood, if these prove to be structured by relations incompatible with feminist aspirations.

In 'The Question Concerning Technology' Heidegger maps out an approach to the relation between technology and man in which the machine or technological artifact is of limited import, except to the extent that it opens onto the broader question of the nature of the technology as a mode of knowledge, a mode of organising the world and man's experience and understanding of it. This problematising of instrumentality is accompanied by a refusal of the 'anthropological' as a means to understanding technology, in line with a more general shift towards displacing man as the stable centre

of knowledge. Within such a metaphysics of the subject, man is that which is knowable to himself, the self-contained subject that apprehends *techne*, such that the constitutive operation of knowledge on man himself is unacknowledged. Thus, for Heidegger it is essential to question the way in which man knows himself in order to grasp the working of modes of knowledge. While Heidegger does not distinguish between woman and man in his elaboration of this relation, feminists have taken up the task as one of crucial importance. I will examine feminist responses to these issues in later chapters, but I want to defer that discussion for the moment. In the second half of this chapter, we turn to Heidegger's account of the status and nature of the subject, in terms of a different but related structure of knowledge, the mathematical. If the *Ge-stell* describes a generalised mode of knowledge which apprehends the world, technologies and man in a particular way – though a constitutive revealing – then the mathematical, for Heidegger, offers an example of the internal logic and structure of that mode of knowledge. In his exploration of the mathematical he grapples more directly with the questions of knowledge and subjectivity on an epistemological level, but remains equally concerned with how knowledge operates to structure both the world and man as subject.

Modern Science & Mathematical Subjects

> Modern science's way of representing pursues and entraps nature as a calculable coherence of forces. (1993b:326)

If Heidegger's description of technology frames it in terms of a way of knowing directed towards calculating and measuring, then to what extent is this the result of the connection between technological development and scientific method? The experimental methodology of modern science is concerned precisely with accounting for the natural world through measuring the behaviours and qualities of natural phenomena.

Does scientific method therefore function as the basis of the enframing which sets-upon nature in order to quantify and store it? Heidegger concedes there is a close link between modern scientific practice and technology, but insists that this is much more than a methodological coincidence. Modern science predates the technological devices of modernity, but for Heidegger it is not prior to 'technology', it is neither the origin nor the source of the *Ge-stell*. Rather, he claims, the reverse is the case: although modern technological objects were not yet developed, the enframing of nature, the challenging-forth – the mode of knowledge which is 'technology' – was already operational and it was through this that modern science emerged as a measuring, calculating, experimental methodology. Again, modern here cannot be clearly delineated as a specific historical period, since the modernity in which technologies emerged was a century or so later than the modernity of the 17th and 18th centuries to which Heidegger traces the emergence of modern science.

In 'Modern Science, Metaphysics and Mathematics' Heidegger finds modern science to be based on a broader framework of knowledge, which he terms the mathematical. It is the operations of the mathematical that locate modern science within the parameters of 'technology'. Equally, it is through the mathematical that a particular mode of subjectivity comes to prominence. This corresponds to the movement in Heidegger toward de-centering the subject and mapping the ways in which subjectivity is elaborated through particular frameworks of knowledge. Heidegger traces an intricate path from classical to modern thought, which serves as the basis for his elaboration of the structure and historical context of the mathematical, as a mode of ordering the world and of the position of the subject within it. It is necessary to follow fairly closely the

development of this analysis to track these complex connections between the mathematical, modern science and the subject.

In examining the conceptual antecedents of modern science, Heidegger provides a detailed account of the emergence of a particular epistemological structure. He explores how such paradigms are established, at the most fundamental level of knowledge, and finds that it is not simply a matter of man being bound within them, but that the subject's very experience of existence and his/her mode of being is constituted through and structured by them. The mathematical is the term he gives to the particular order and structure of knowledge that came to predominance in modernity. This is not incompatible with the *Ge-stell*, but rather seeks to explore the internal logic and structure of that mode of revealing, or knowledge. As with technology and technologies, the mathematical is not simply mathematics, in the sense of numerical calculation, but rather, it is a mode of knowledge that acts fundamentally as a means of encountering and understanding things. The two are obviously related, in so far as the mathematical structures all knowledge including mathematics. Moreover, mathematics as a system of inquiry and methodology is an exemplary way of representing the mathematical. However, the mathematical itself is far in excess of the merely numerical.

Heidegger traces the conceptual antecedents of the mathematical to the classical Greek understanding of *mathemata*, which situates the mathematical as a way of knowing. The term described a mode of teaching and learning and, as such, demarcates the domain of that which can be learnt and taught (1993b:274). It is a particular understanding of knowledge, wherein what is learned is always that which is already known. That is, all knowledge proceeds from a ground that is known in advance:

> The *mathemata* are the things in so far as we take cognizance of them as what we already know them to be in advance, the body as the bodily, the plant-like of the plant, the animal-like of the animal, the thingness of the thing and so on. This genuine learning is ... a taking where he who takes only takes what he already has. (271)

The learner cannot learn anything, unless he already has in place the conceptual framework that allows him to understand and recognise that which he encounters. Any encounter with an object of knowledge can only make sense, that is, can only be learned, on the condition that it be apprehended through an existing conceptual framework. Thus the mathematical does not simply describe a pedagogical regime, but it is also a way of knowing that mediates and constitutes man's very relation to things themselves, the medium through which he encounters them and the mode in which they become intelligible to him. The mathematical "is the evident aspect of things within which we are always and already moving and according to which we experience them as things at all, and as such things" (277).

Heidegger traces the coming to prominence of this way of knowing through the emergence of modern science. He claims that, while the mathematical as a presupposition of the knowledge of things has its conceptual antecedents in Greek thought and slowly developed throughout the fifteenth and sixteenth centuries, it found its "systematic and creative culmination" (279) in the seventeenth century, with the appearance of Newton's first law of motion. For Heidegger, the arrival of the first law of motion displaced all previous conceptions, not simply of motion, but of the way things, space and time were understood. Newton's axiom that "every body left to itself moves uniformly in a straight line"(287) thus effects a radical break from earlier ways of

understanding the behaviour of things in space and time. Heidegger contrasts it to the classical Greek concept of motion, whereby the type of motion and relation to place of a body was derived from the nature of that body, so that all things moved according to their nature. In this conceptual world "each body has *its* place *according to its kind* and it strives toward that place" (284). Thus an earthly body, such as a rock, would move downward when launched into the air, to the realm of the earth, and a fiery body moved upward to where the place of fire was thought to be. Newton's first law of motion, which held that a universal movement of motion existed irrespective of the diverse nature of moving bodies, effectively removed motion from the nature of bodies. Moreover, it posited all bodies as equal, in the sense that all bodies are uniformly subject to the law of motion. Finally it removed the specificity of place from the body: bodies, left alone, moved in a uniform direction rather than toward their 'natural' place and, thus, any body could theoretically occupy any place (284). Motion, then, was no longer a matter of changes in the nature of a body or movement toward its proper place, but rather a case of generalised movement from place to place to which all bodies were subject. Thus the law of motion radically reconceptualised the nature of things:

> All determinations of bodies have one basic blueprint, according to which the natural process is nothing but the space-time determination of the motion of points of mass. This fundamental design of nature at the same time circumscribes its realm as everywhere uniform. (291)

This uniformity made possible a universal system of measurement, in so far as it recognised only quantitative differences of distance and mass between things, rather than qualitative differences of nature, which could not be accounted under a single measuring system. Thus, when Newton's law appeared, it was not simply the presentation of a more concise and accurate system for measuring everyday experience

of the world, but rather a refiguring of how the world was constituted which brought with it a radical re-conception of nature and things in general.

For Heidegger, the significance of Newton's first law is that its particular reconfiguration of the world was of the order of the mathematical and its general acceptance therefore marked the coming to prominence of the mathematical as the mode of modern thought. Newton's law operates in the mode of the mathematical to the extent that it is premised on something that does not exist: the object left alone. The mathematical is a mode of knowing based on a thing that doesn't exist, as in any encounter with a thing the learner arrives at an understanding not from a direct experience of that thing but through the conceptual framework he already has, which is not grounded in the thing itself. The mathematical proceeds by way of "the application of a determination of the thing which is not experientially derived from the thing and yet lies at the base of every determination of the things, making them possible and making room for them" (289). The learner can only learn from what he already has, rather than from a direct encounter with the thing itself, and thus the thing becomes determined according to the learner's formulation of the thing, which is formed without any unmediated access to, or contact with, the thing in itself. In this way, the world becomes determined by something that doesn't exist. The 'real' object escapes the mathematical, and is reconstituted only through the field of knowledge which is at a remove from it and which overlays or overcodes it. The mediation of the mathematical "opens a domain where things, i.e. facts, show themselves" (291). This domain of revealing is the field of axioms that constitute the mathematical, the fundamental propositions by which the mathematical orders the world of things and through which the subject knows them: "Natural bodies are now only what they *show* themselves as

within this projected realm" (292). Thus the mathematical determines how things appear and how they are understood. It is the frame that functions to exclude other understandings or experiences of things by requiring them to be apprehended in particular ways in order to be intelligible:

> As axiomatic, the mathematical project is the anticipation of the essence of things, of bodies; thus the basic blueprint of the structure of everything and its relation to every other thing is sketched in advance. (292)

For Heidegger, all modern thought proceeds on this basis, but the experimental methodology of modern science offers an exemplary site at which to discern the mathematical in operation. Modern science constructs experiments to measure the behaviour of things, natural phenomena based on its presuppositions of how they will behave - that is, based on a predetermination of their nature. Any inquiry takes place only within the parameters of the mathematical mode of knowledge and, as such, it "poses conditions in advance to which nature must answer in one way or another" (292).

Is it, then, through the operations of modern science that the mathematical intersects with technology. Heidegger rejects outright a purely causal explanation of technology, which sees it only in terms of applied scientific knowledge. Again, he concedes that the notion of technology as applied science is 'correct', to the extent that technological development arises from, amongst other things, the application of various scientific methods and practices. However, as we have seen, as Heidegger describes it, technology is not fundamentally derived from technological objects, equally modern science belongs to the mathematical but is not the basis of it. Rather the intersection of the mathematical and technology has to be considered on the level of how they function

as frameworks and ways of ordering the world. In one sense, we can see that Heidegger is investigating the same questions via two different lines of approach: how do things reveal themselves in the modern world? how are things apprehended by knowledge? In his examination of the mathematical, he traces an internal logic or structure of knowledge through which things are apprehended and known. Likewise in seeking the 'essence' of technology, he finds a 'framework' through which the world is revealed and ordered. This is not to force a seamless continuity between the two: the *Ge-stell* is not simply the mathematical by another name. As a mode of revealing it can however be described as proceeding in a mathematical mode, since it proceeds by calculating, measuring and ordering. Thus, while Heidegger gives precedence to technology (as *Ge-stell*) as a fundamental mode of apprehending the world, in terms of a systematic calling on nature to report to man through a system of measurement and calculation, the mathematical still functions in concert with technology as enframing. The mathematical, as a way of knowing wherein only that which is already known can be learnt, brings to the encounter with things and nature a structure of knowledge into which they must fit. As such, it also sets upon them to reveal themselves in a particular way. This way of knowing lends itself to structuring the field of knowledge in particular ways. That is, it supports particular epistemological structures. In the instance of the mathematical, these are the measuring and quantifying of modern science, which makes nature a calculable field. In this way, the mathematical coincides with the ordering of nature into standing-reserve carried out by technology.

Mathematical Subjects

Given that a central concern of Heidegger's exploration of technology is the nature of the relation between technology and man, it is not surprising that he broaches this

question in his examination of the mathematical, albeit by a different route. The mathematical is not simply restricted to scientific methodology, but pervades all aspects of modern thought, including metaphysics. For Heidegger, the emergence of the mathematical is at the heart of the constitution of the modern subject; not simply in the way a subject perceives and encounters the world, but in the way subjectivity itself is structured. In keeping with his de-centring of the subject, he sees modern subjectivity as a distinct historical formation, tied to the operations of a particular mode of knowledge, rather than an enduring ontological condition. In the mathematical Heidegger is concerned not with the way man is revealed, but with the function of subject within the structure of knowledge.

According to Heidegger, the arrival of the mathematical marks an epochal shift in the foundations of knowledge. Prior to its emergence, the Church had been the centre of truth and knowledge, but the shift to the mathematical required that truth and knowledge require no sanction from God, but rather that the truth be self-evident and self-contained:

> In the mathematical project develops an obligation to principles demanded by the mathematical itself ... According to this inner drive, a liberation to a new freedom, the mathematical strives out of itself to establish its own essence as the ground of itself and thus all knowledge. (296)

To the extent that, the mathematical as axiomatic "intends to explicate itself as the standard of *all* thought and to establish the rules which thereby arise" (301), it must be organised and founded along the lines of its own inner logic and requirements. According to Heidegger, this requirement is answered in metaphysics through the formulation of the Cartesian cogito. The self-evidence of the subjective 'I', as that

which cannot be doubted when all things are doubted, becomes the means to establish the self-certainty of knowledge. Heidegger traces the function of the subjective 'I', in establishing the self-evident ground of the mathematical project, through an examination of the operation of propositions. He sees that all propositions must be grounded on a principal of positing and that this principle is to be found in a first proposition which is self-evident. A first proposition is neither a commentary on, nor an encounter with a thing, but a proposition that is entirely self-evident and self-referential and can thus function as the principle of all positing. This first proposition is articulated in the form of a pure propositionality, which functions as the ground for all knowledge. For Heidegger, it is through the propositional structure of the cogito that it is possible to establish such absolute self-referential certainty as the basis of knowledge. The thinking subject becomes the self-evident proposition to the extent that, while all determinations of thought might be doubted, the movement of doubt itself guarantees the self-evidence of the thinking subject. In the 'I think', any act of thought installs a thinking subject, in so far as the act of thinking is always an '*I*' think. While any proposition arrived at through thought might be dubious, the act of thinking itself installs the self-evidence of the 'I' that thinks. Thus, the 'I' functions as the first principle: "The I, as 'I think' is the ground upon which hereafter all certainty and truth are based" (304).

In addition to functioning as the self-evident ground for knowledge, this subject is bound to the mathematical and its axiomatic in another register. When thinking itself, the subject is absolutely mathematical, in so far as it is taking cognizance of what it already knows. This configuration of the subject works to install an epistemological structure of subject/object at the heart of the mathematical and its mode of configuring the world:

> Until Descartes everything at hand for itself was an "object" but now "I" becomes the special subject, that with regard to which all the remaining things first determined themselves as such. Because - mathematically - they receive their thingness only though the founding relation to the highest principle and its subject (I), they are essentially such as stand as something else in relation to the subject, which lie over and against it as objectum. The things themselves become objects. (303)

Thus the arrival of the mathematical installs the modern subject as we know it and that subject functions as the guarantee of the self-evidence of the mathematical and the ground for all knowledge.

The mathematical, for Heidegger, is the system of understanding and ordering the world which, through the internal requirements of its logic, articulates a subject. Modern man becomes defined by this formation by virtue of his centrality to knowledge. The emergence of this figure of man as 'I' provides the necessary ground for the self-evidence of the mathematical mode of knowledge and guarantees a veneer of self-evidence which maintains and perpetuates the mathematical and provides the basis for all subsequent ordering of the objects of knowledge. The mathematical is not only at the base of a numerical science but also functions as the very structure of knowledge through which all aspects of the world are rendered intelligible: it sets the limits of knowledge and orders all things within these confines. That the 'I' is central to the establishment of the mathematical attributes no special status to man. Rather, he assumes the position of subject, which functions in the first instance as a structural necessity and historical contingency, not as a reflection of the nature of man's encounter with the world:

> By virtue of this fundamental significance for the foundation of all knowledge, the "I" thus becomes the accentuated and essential definition of man. (304)

The subjective 'I' does not describe the Being of man, but rather marks a highly historicised mode of emergence of man as 'I'. It explains how the subject came to be that around which objects were to be ordered, not for reasons of a natural precedence or conscious agency of the human, but because of the necessity for a self-evident and self-referential 'I' as the structural foundation of the edifice of the mathematical.

How then does this mathematical framing of the emergence and centrality of the subjective 'I', to which man gravitates, sit with the understanding of man and technology within the *Ge-stell*? The mathematical and technology coincide in respect to de-centering the subject, or man. In both accounts, Heidegger finds the superficial appearance of man as that in respect to which all other objects and nature itself is ordered, and in both he demonstrates that this is only a partial understanding. In the case of the *Ge-stell*, man appears as both the originator and recipient of the benefits of the enframing of nature as standing-reserve. However, Heidegger finds that he is more originally 'challenged-forth', that is, ordered by knowledge, and that subsequent relations between man and nature, or man and technological objects, are circumscribed and determined by the operations of this particular mode of apprehending nature. Within the mode of revealing of the *Ge-stell*, to the extent that he must be already enframed in order to enter into any encounter with technological objects and to possess any understanding of nature, both of which are equally enframed, man is more originally 'challenged-forth', more originally ordered. Thus technology, as a mode of knowledge which reveals by 'challenging-forth', determines man according to and entirely within itself. Man, then, is equally articulated through the mode of knowledge that seemingly

apprehends and orders the world in response to his desires and needs. Thus, he cannot be understood to stand outside that mode of knowledge, as its originator, nor can he occupy a privileged position in relation to the objects articulated through that framework.

The apparent centrality of man is evident in the mathematical in so far as the subject as learner already knows what he learns and thereby immediately orders the world to comply with that framework. Moreover, the 'I' functions as the ground of all knowledge in relation to which all other things become objects. Here again, though, it is only because the subject is more originally challenged that man occupies this apparently elevated status. The 'I' becomes the guarantee of knowledge as a structural requirement of the axiomatic of the mathematical and is entirely determined by the logical requirements of the latter. To be positioned as the determining point of knowledge requires that the subject be entirely determined himself. Thus, while differing in terminology and lines of inquiry, what we see in Heidegger's analysis of technology and the mathematical is a complex picture of modes of knowledge as impersonal historical configurations, which structure man as knower, as much as the field of objects of knowledge and ways of knowing.

Technology and Change

Are technologies irretrievably bound to technology? Is the 'essence' of technology as enframing the only possible configuration of the relations between technological objects and man? This is, of course, the question of the possibility of transformation. The seeming pervasiveness of the *Ge-stell,* while offering an understanding of technologies beyond that of simple neutrality or causal determinism, seems nevertheless to shut down

the possibilities of technology as an avenue of change. Within the framework, the relations are given and humans as subjects embedded therein, as are technological artifacts the moment they appear. While Heidegger contends that this particular arrangement isn't necessarily for all time and in all contexts, he remains convinced of the power and durability of the paradigm 'modern' technologies inhabit and, likewise, convinced of its oppressiveness and obstinance. In his model, the meanings of technologies (and humans) remain stable and fixed, to the extent that they are articulated within the framework of the *Ge-stell* and thus not open to contestation or subversion unless a wholesale displacement of the mode of enframing is enacted. In this respect enframing is universal – there can be no technologies or humans, as understood in modernity, outside it – it is the condition of the possibility of both technologies and man. For Heidegger, it is the mode in which Being is captured in this particular era. Likewise, in his historical description of the emergence of the mathematical as a mode of knowing the world, he holds that it delimits the conditions of possibility of knowledge in modernity. It sets out the parameters of knowledge and it is on these grounds that man is constituted as subject, that his relation to things and the world is determined. Things are unintelligible, unknowable outside of the mode of knowledge which is the mathematical. However, to the extent that he marks both the *Ge-stell* and the mathematical as belonging to the 'modern era', he concedes that as historical configurations such modes of knowledge are neither eternal nor transcendent nor originary. They are contingent, which implies at the very least the possibility of other sites or modes of configuring the subject and other relations between the human and the technological. However pervasive and powerful they appear, however difficult Heidegger finds it to imagine dislodging them, the *Ge-stell* and the mathematical are neither eternal nor stable.

Under the auspices of investigating technology, this chapter has spoken relatively little about technologies themselves. Indeed, Heidegger may seem an incongruous thinker with whom to begin an inquiry into emerging technologies, since he is very quick to shift the focus of analysis away from technological objects, practices, developments and uses. However, while Heidegger's analysis of technology is clearly embedded in his wider project of thinking the mode and nature of Being, which is not our emphasis here, it nevertheless offers insights in other registers. I would argue that what is most useful in his analysis is the detour away from technological objects and systems, in which he demonstrates that technologies are embedded within systems of knowledge that shape man's understanding of them, but also and importantly, shape man. This shift offers several suggestions for analysis of technologies: firstly, that instrumentality offers only a partial explanation of technologies; secondly, that man can in no way be assumed unproblematically to be in control of technologies, or even to be a given in and of himself; thirdly, that the connections between man and technology need to be sought, not simply in their day to day interactions, but in the systems of ordering and modes of knowledge through which they are articulated; and finally, that transformational projects need to address themselves, at least in part, to these frameworks of knowledge.

Thus Heidegger demonstrates that an inquiry into technological objects must necessarily be concerned with more than simply assessing what man does with any particular set of technological objects. He outlines an understanding of man's relation to technology, which insists they are inextricably and intimately bound together. But to explain their relationship solely in terms of instrumentality is to mistake its true nature. It is at the level of knowledge that a more complex picture of man's relation to technology emerges and it is on this level that we find the conceptual framework which articulates both

technology and man. Heidegger traces out the lines of constitution of man in the technological milieu of modernity, where man becomes formulated in terms of the subject, the 'I'. In so doing, he demonstrates how man takes on a structural position which not only deprives him of agency, but removes him from the position as originator of knowledge. Man and technologies both become located within a broader schema of knowledge which organises and constitutes not only a particular mode of subjectivity but also man's experience and understanding of all things including himself. Within this ordering, technologies become objects in relation to man's subject, a process which functions as the basis for an instrumental notion of technology. It is, according to Heidegger, only by looking beyond the instrumental that we can discern what constitutes and orders, not just technologies, but man himself, and what governs the conditions of engagement between the two. For feminists these insights are valuable in so far as they historicise the subject and refuse a transcendent figure of man. Heidegger's work thus offers a context for feminist investigations of how and in what configuration the relations between man and technologies are elaborated at any given historical juncture. In addition, Heidegger's analysis points to knowledge as a key site at which intervention is required by feminist transformative undertakings aimed at realigning relations between man, woman and technologies.

By taking this considerable detour away from women's interaction with technological objects and practices, I have begun to sketch out the parameters within which to take up the question of feminist transformation and cyberspace. Before addressing that question, I want to explore further the question of technology and knowledge, in order to bring to bear questions of everyday practice and power relations. Foucault offers an approach to technology directed more specifically at the relation between modes of

knowledge and everyday practice. He is also concerned with the formulation and functions of the subject and the relations between these. In his work, we find a consideration of the operations of technological objects, which refuses equally instrumentalism and anthropologicalism, but which is more explicitly concerned with the relations between technology, power and knowledge. It is to this work that we turn in the following chapter.

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[1] Grint and Gill adopt the 'technology as masculine culture' position and assess other accounts of technology from that perspective. They do not include in their overview of feminist approaches to technology any consideration of post-modern, or what has sometimes been called 'cyborg' feminist approaches. Judith Wajcman in *Reflections on Gender and Technology Studies* considers the state of feminist technology scholarship and notes that in the 1990's this approach to technology has become increasingly important, particularly in theorizing information technologies and new bio-medical technologies (2000:457). Wajcman sets out her overview of feminist technology studies along the lines of a progression or evolution of thought, which concurs with Grint and Gill, who suggest that liberal feminism arose as a response to the shortcomings of eco-feminism, and social constructivist feminism appeared as a response to both. Wajcman would add postmodern feminism as the latest evolutionary stage of that movement. However I would argue that this is not necessarily the case, as eco-feminism, liberal feminism and constructivist feminism all remain active sites in theorizing technologies including those of cyberspace. For eco-feminist analysis of cyberspace technologies and practices see Zillah Eisenstein (1998) *Global Obscenities. Patriarchy, Capitalism, and the Lure of Cyberfantasy.* and Renata Klien & Susan Hawthorne eds. (1999) *Cyberfeminism.* For examples of Liberal Feminist accounts see Laura Miller. (1995) *Women and Children First. Gender and the Settling of the Electronic Frontier,* Elizabeth Reba Weise (1996) *A Thousand Aunts with Modems* and Dale Spender (1995) *Nattering on the Net.* Prominent social constructivist accounts in this field include Susan Leigh Star, ed. (1995) *The Cultures of Computing* and Lynn Cherny and Elizabeth Reba Weise eds. (1996) *Wired Women. Gender and New Realities in Cyberspace.*

[2] This approach informs a wide range of feminist analysis of particular technological formations and practices. However for direct discussion of the central tenets of social constructivist thinking on technology see Judy Wajcman (1991) *Feminism Confronts Technology*, Cynthia Cockburn, 'The Circuit of Technology: Gender, Identity and Power.' in Silverstone & Hirsch eds. (1992) *Consuming Technologies,* Susan Ormrod, 'Feminist Sociology and Methodology: Leaky Black Boxes in Gender Technology Relations.' in Grint & Gill eds. (1995) *The Gender Technology Relation: Contemporary Theory and Research.*

[3] Keith Grint and Steve Woolgar in 'On Some Failures of Nerve in Constructivist and Feminist Analyses of Technology' (1995) criticize the notion of patriarchy serving 'men's interests'. They point out that this assumes an essential difference between men's and women's interests which reinstates an essentialism. Further, they problematise any account of technology which sees relations of power or interest as 'built into' the technological object in so far as this implies an originally neutral object available for coding along lines of interest. They want to elaborate a model of technology where it is neither neutral nor essentially masculine, but its meanings established within the social field. Accordingly, any gendering of technologies occurs in the understandings and uses of it which arise from within a gendered social field.

> We have suggested... that the gender of a technology does not lie encased in the fabric of a material. It is instead the temporary contingent upshot of on-going interpretation by designers, sellers and users. (Grint & Woolgar 1995:70)

While this moves some way toward locating technology in the realm of a generalised social construction of meaning not specifically dictated by 'men's interests', I would argue that it ultimately turns on a

proposition that the 'designers, sellers and users' are in a position to make such interpretations which reflect, and thus serve, their own interests. As such, Grint and Woolgar also rely on a basically instrumental model of technology.

[4] In the German text published in *Vertrage und Aufsatze* (1954) Heidegger uses the word Mensch, which translates as 'human'. In the William Lovitt's English translation, which appears in Basic Writings (1993), it has been translated as man. In this chapter, I will follow the translation and use man.

[5] Heidegger makes a distinction between the technological which serves to designate machines, processes and systems and 'technology' which refers to a mode of ordering and organising not limited to the operation of particular technological objects. Following Heidegger when we speak of the artifacts and machines we will use the term technological, or technologies, while 'technology' will function as a much broader term and refer, as we shall see, to a complex framework which Heidegger terms the *Ge-stell*.

Chapter 2

Technology and Power-Knowledge

Technology is therefore social before it is technical.

Gilles Deleuze. *Foucault*

In the previous chapter, I argued that the question of technology is inseparable from questions of knowledge and began to examine how even the most straightforward understanding of technology, as a set of instruments, opens onto the question of the conceptual frameworks through which both the user and the technological object are articulated. For feminists concerned with technology, this suggests that analysis cannot rest solely on examining social practices of gendering and their connection with technologies, but must also consider the underlying conceptual frameworks through which the configuration and arrangement of subjects and objects are articulated. In this chapter, I want to consider in more detail the elaboration of the relation between knowledge and practice. For feminists, this is clearly a salient issue in so far as it might indicate a way to investigate technology which will not be confined to the instrumental, but which can examine the relation between man and technology while at the same time accounting for the everyday interactions between men and technologies, and women and technologies.

I began the previous chapter with a brief examination of a model of technology operative across various feminist approaches. From this discussion it became apparent that social constructivist feminists were the most interested in theorizing the mechanisms and structures through which technologies are configured as masculine and the masculine as more attuned to technologies. Implicit in their approach is the assumption that women's relations with technology are largely negative and tend to perpetuate the current subordination of women's interests to men's. This notion of 'interests' belongs to an instrumental notion of technology, which Heidegger saw as 'correct', but insufficient to provide a full account of the nature and workings of technology.

Susan Ormrod finds constructivist feminist accounts of technology bound to an instrumental understanding, in which gendered subjects are established as the pivot around which relations to technology are subsequently organised; for example, masculinity as the position of power in the instance of patriarchy.[1] She suggests it is simplistic to propose patriarchy as a set of 'top down' power relations, organised and implemented by men to serve their interests. She refuses the assumption of a motive force as the explanation for the operations of power. For Ormrod, power is not an object to be organised and deployed through the action, individual or collective, of subjects. Rather, she proposes a Foucauldian understanding of power as impersonal and productive: "it produces knowledges, meanings and values, and permits certain practices as opposed to others" (1995:34). On this understanding, she claims that the relations between gender and technology arise in the context of prevailing relations of power and knowledge and that it is these relations which delimit the particular subject positions available to men and women:

> present differentiations of gender may produce the dominance of a certain version of masculinity (and particular men) around certain practices of technology. (36)

Rather than engage in sweeping statements about the gender of a technology, she suggests that attention should be turned to the specifics of practice and discourse. In the remainder of this chapter I want to pursue this line of inquiry and, through a reading of Foucault, examine how a consideration of the question of power can illuminate the connections between everyday practice and frameworks of knowledge. There have been many productive encounters between Foucault's thought and feminism, particularly concerning the relation of gender and practices of social subjectivization.[2] However, I

again want to defer the specific question of women and technology, my principal interest at this point being in how Foucault illuminates the relations between power and knowledge, and how they traverse the social field and articulate relations between technology and subjects.

In contrast to Heidegger's lengthy contemplation of technology as a mode of revealing of being and as a mode of knowing, Foucault concerns himself with technology only in the context of its intersection with the operations of power and knowledge across social fields.[3] While there are obviously significant differences in approach, both Heidegger and Foucault were interested in the conditions under which man and technology are established, both as singular entities and in a relation to each other. This is not to suggest a seamless continuity between the two. Unlike Heidegger, Foucault is concerned neither with directly investigating the nature of technology, seeking its essence, nor with contemplating man in his mode of Being. Rather he is interested in how power traverses and orders the relations between man and technology and in the formation of particular modes of subjectivity. He is also concerned with the constitution of man as a figure within discursive practices and frameworks of knowledge that operate in conjunction with strategies of power. His approach offers an account of man, technology and their relations, which encounters Heidegger at moments, especially in its anti-subjective and anti-instrumental moments, but which puts the questions of man and technology in a very different context.

In Foucault direct discussions of technologies arise only occasionally, in the course of his more general examinations of social practice. One such discussion occurs in *Discipline & Punish. The Birth of the Prison* where Foucault offers an account of the

tangible ways in which power pervades the meeting between man and technology in everyday encounters. This is a reading of an everyday engagement with technological objects, which moves beyond the instrumental model. While within the domain of the social and under the shadow of the diagrams of power which shape it, for Foucault, this is not the only context in which technology-human encounters are articulated. Knowledge is an equally significant force in the processes of articulating subjectivities and conditioning the relations between subjects and the field of objects. The second half of this chapter shifts focus from the social subject, so as to examine Foucault's account of man, as an historical figure of knowledge. Knowledge and power are inextricably bound for Foucault and working through his account of both man and technology illuminates the complexity and scope of their inter-connection.

Technology and Power

If the instrumental conception of technology, while correct, does not account for its 'true' nature, Heidegger nevertheless raises two important issues in reference to instrumentalism: firstly, under the guise of instrumental use the notion is perpetuated of technology as neutral and available to serve man's needs; secondly, that when man believes in this instrumentality he is at that moment the most deeply interpolated into the prevailing framework of knowledge and order. Like Heidegger, Foucault does not hold that technological objects and machines are neutral and freely available to whatever purpose individuals desire. However, where Heidegger is content to note as 'merely correct' the instrumental nature of the contact between man and technological object and to focus his investigation on uncovering the 'truth' of this relation on another level, Foucault undertakes a more sustained contemplation of the forces at play at that point of contact. He is more expressly concerned than Heidegger with identifying the social and

historical contexts within which technological objects are encountered, understood and function. Moreover, for Foucault, any question of social and historical contexts is also always a question of the operations of power.

Foucault undertakes a number of historical or 'archeological' investigations across a range of social institutions and practices and finds that, without adequate attention to the operations of power within those institutions, it is impossible to reach any understanding of the basis on which they are established and function (1988:38). Foucault has a very complex understanding of power, though he claims he never elaborated a general theory of power, but rather was interested in mapping the strategies whereby a particular set of power relations are elaborated and operationalised across both social institutions and fields of knowledge (38). This is a crucial point in so far as it suggests we might analyse social institutions and practices in terms of how technologies, subjects and power intersect. Foucault elaborates several key characteristics of power I want to outline and explore as they arise in the consideration of technology: firstly, power is impersonal, exercised neither by any one person nor class; secondly, it functions in general, not through direct violent imposition (though it can and does in certain instances), but principally through a set of techniques of management, and ordering; thirdly, it operates equally across large cultural and social institutions and the most intimate events of daily life; and finally, it traverses the realms of both discourse and practice. On this understanding power is not a property or a thing that can be possessed and then used or applied. Rather, according to Foucault, it is best understood as:

> a strategy, that its effects of domination are attributed not to 'appropriation', but to dispositions, maneuvers, tactics, techniques, functionings; that one should decipher in it a network of relations, constantly in tension, in activity, rather than

> a privilege that one might possess... In short this power is exercised rather than possessed... (1977a:26)

Foucault contends that power operates through different strategies across different historical regimes. In *Discipline and Punish* he traces differing strategies across a series of such regimes, through examining a key site where power is often at its most visible in society, that is, the operations of state-sanctioned punishment. Foucault concludes that developing in the classical period (the seventeenth and eighteenth centuries) and continuing into modernity, discipline functions as the pre-eminent mode for the organisation, distribution and operation of power. This is most visible in the functioning of the great institutions of discipline - prisons, barracks, schools and factories - but Foucault contends that this disciplinary strategy is equally active across a whole field of 'micro-practices', through which power is insinuated into the very substance of the social subject. It is through disciplinary processes that individuals come to inhabit and participate in social institutions, while those institutions function simultaneously to enact the disciplinary regulatory process. Disciplinary practices are the means through which social subjects are articulated, as well as by which such subjects are regulated.

While Foucault is interested in the strategies and operations of power that circulate around the subject, he is committed to an anti-subjective account, not only of power, but of the formation and regulation of social subjectivity. For Foucault social subjects are articulated through mechanisms of organisation and management of everyday bodily practice and the associated conceptual frameworks that render only particular subjects intelligible. Bodies, for Foucault, are a crucial site at which power intersects with individuals, through which specific modes of subjectivity are articulated and practices of

disciplinary management mobilised.[4] Thus, in the encounter between technological objects and man, strategies and mechanisms of discipline distribute relations of power across the meeting of technologies and bodies:

> Over the whole surface of contact between the body and the object it handles, power is introduced, fastening them to one another. It constitutes a body-weapon, body-tool, body-machine complex. (153)

Beginning with this moment of contact between a technological object and a body, we can trace Foucault's account of how power functions in a disciplinary mode, as well as the understandings of technology and subjectivity that are operational. According to Foucault, discipline operates as a regime of order and management principally by regulating the way bodies are distributed in space and move through time in that space. A body regulated in time and space, within social institutions and practices, becomes productive and controlled. Foucault insists that discipline enacted at this level is not a coercive control, such as operates in penitentiaries and military institutions, but is intrinsic in the practices of everyday life. His mapping of relations between bodies and objects provides, not only an example of the subtlety and ubiquity of such regulation, but an indication of the precedence of particular bodies and conceptions of technology over others. In his discussion of the use of tools and machines he notes how discipline acts to fix the body in a certain way. Movement becomes broken down into minute elements, a succession of movements is determined, and the timing of these movements is dictated. This schema is correlated to corresponding dimensions and movements of the tool or machine, which becomes transposed into the range, succession of movement and the spatial organisation of the body:

> It consists of a breakdown of the total gesture into two parallel series - that of the parts of the body to be used (...) and that of the parts of the object to be manipulated (...); then the two sets of parts are correlated together according to a number of simple gestures; lastly it fixes the canonical succession in which each of these correlations occupies a particular place. (153)

Such regulation produces a particular understanding of the body: an "instrumental coding of the body" (163) different from prior conceptions. According to Foucault, prior to the notion of training as a way to apprehend and order bodies, the dominant conception of bodies was as mechanical devices, which discipline simply activated along particular lines. That the enaction of discipline requires a re-categorisation or a revised understanding of bodies, demonstrates the interrelation of power and knowledge. With the appearance of 'training' as a regulatory device, a new body appears, a natural body: "susceptible to specified operations which have their order, their stages, their internal conditions, their constituent elements" (155). Clearly, here we see the interrelation between knowledge and power: new mechanisms and techniques of power arise to apprehend and manage new formulations of the body, which appear in part through daily practices of management such as training. Equally, bodies become the object of new forms of knowledge, such as a biology, aimed at determining the 'natural' capacities of bodies, which might then be ordered according to and through disciplinary practice. This is not to suggest a clear causal relation between strategies of power and frameworks of knowledge. Rather, such transformations are cumulative and simultaneous. New disciplinary techniques both depend on and at the same time precipitate new understandings of bodies; and new objects and forms of knowledge emerge to account for new distributions of bodies, which are generated by strategies of power operational in everyday practice. On this understanding, everyday

practice such as training, through which discipline is operationalised, is equally informed by the particulars of the conceptual framework within which it is articulated.

Strategies of power not only suppose a particular understanding of the body, as one which is readily adaptable to the specific needs of the machine, but also privilege a particular understanding of the technological object; that is, it can only be operated and used in a particular manner for set purposes. It is a two-way flow of control: a disciplined body is required to operate the object in the correct way; and the operating of the technological object enacts discipline on the body. This is not to say that the technological object is inherently imbued with a disciplinary requirement. On the contrary, it is only when it interacts with bodies under the conditions prescribed that it becomes enmeshed in the disciplinary process and power becomes operational. In this manner, the practices and techniques of disciplinary power intervene at the site of bodily contact with objects. They not only regulate the use of those objects, but also require a particular understanding of the body as it interacts with those objects. The operations of the machine-artifact/body interface is a site traversed by power, through which bodies and technologies are distributed in particular ways. In insinuating power at the moment of body-technology contact, Foucault is able to avoid any notion of a subjective taking up of technologies in a purely instrumental manner. Rather, technology is located in the same field of disciplinary practices and arrangements through which social subjects are articulated. As such, subjects cannot freely take up technologies, nor are technologies ever neutral in their encounters with humans. This refusal of neutrality does not imply that technologies are themselves imbued with power, which they then disseminate. Rather, it is only within the practices and distributions of each encounter that power is operational.

Thus, within disciplinary society in so far as subjectivity is articulated through ordering bodily practice, it involves engaging with technologies in specific ways. For example, for the soldier, it is not a matter of knowing how to use a weapon: rather his body must be attuned to a specified set of movements and positional aspects, which are established as the 'correct', most efficient, productive manner in which to complete such an activity. This 'correct' manner is not dictated by the weapon itself, since there are any number of ways in which it may be activated, nor is it determined by an authoritative knowledge of it as the 'truth' of weapon use. 'Correctness' is at once a product of a particular set of knowledges, such as metallurgy, geometry, biology and so on, and a regulatory device: the actual details of the procedure are irrelevant; the fact that there is a procedure in place, which governs the interaction between a body and a technology, is the moment of operation of discipline.

It might appear that Foucault is proposing a deterministic model of technology, whereby technologies are the instruments of the disciplinary regime that deploys them to create bodies and subjects compatible with the dominant regime. However such a reading misapprehends Foucault's central claims about power, as it reintroduces the question: 'who is establishing these procedures and insisting on their being taken up?' That is, it assumes that, if technology is deployed within a practice to elicit maximum productivity from a body, it must have been thus configured and distributed through the conscious actions of some group or individual. This is, of course, a version of the problem of an anthropological understanding of technology, which Heidegger raises. It ties the question of technology to that of subjective agency, as a conscious choice by those in possession of power to exercise it through technological objects. Foucault, however,

insists that power is not possessed or exercised by a class or an individual; that it is impersonal, and functions equally to articulate those who appear better served by prevailing social configurations and those less so (26/7). The question Foucault asks regarding technology and power is, rather: how does power traverse the institutions and everyday practices of technology use? and how within disciplinary societies do particular articulations of both user and used emerge? For Foucault, power is operational in disciplinary institutions and practices that intervene at the site of bodily interaction with technologies and it gives rise to certain bodies, and concomitantly certain subjects, as well as certain articulations of technologies. It is at this micro-level that relations between technologies and subjects are elaborated and power operationalised in their encounters, rather than through a structure of 'top down' determinism, whereby technologies serve particular interests by determining particular subjects.

Technologies are not transparent media for channelling power into previously uncontaminated bodies, nonetheless in the space of the body-technology encounter the forces of discipline find a fertile ground for enacting particular patterns of distribution of time and space, which set the parameters for bodily/technological interaction in such a manner as to elicit particular bodily practices and distributions. It is not the technological object that embodies and transmits discipline; rather technologies are developed and function within a web of disciplinary practices that articulate them in particular ways. This is not to assume that, prior to their engagement, either bodies or technologies are originally neutral, waiting to be taken up by power. Technologies are developed, manufactured, deployed and encountered within a variety of institutional settings they are never outside. Likewise, bodies are always already located within

social institutions, fields of objects and frameworks of discourse. Thus, to the extent that power is operational in those institutions and discourses, there can be no claim of an original neutrality for technology, or bodies, which is then over-coded by power in the course of its daily deployments.

Knowledge and Power

As we can see, Foucault asks a very different question from Heidegger regarding technology: he does not move beyond the instrumental to the essential, in search of an underlying mode of being and knowing; rather, he asks how in everyday practice technology intersects with power across both the macro and micro levels of social institutions and individual activity. This is not to suggest that his account is confined to concrete practice. As we saw in his account of the meeting of technological objects with bodies, he believes that disciplinary mechanisms require particular understandings of those bodies and technologies, which do not arise solely from that encounter, but belong equally to particular discursive frameworks. If Foucault is not overtly concerned with the pursuit of the 'essence' or 'truth' of technology, he is nonetheless very much interested in the question of knowledge. For him, knowledge is always also a question of power and truth a product of power-knowledge operations, rather than an essence to be divined. Moreover, in order to understand the function and mode of operation of knowledges, Foucault believes it is necessary to abandon:

> a whole tradition that allows us to imagine that knowledge can exist only where the power relations are suspended and that knowledge can develop only outside its injunctions, its demands and its interests... We should admit rather that power produces knowledge (and not simply by encouraging it because it serves power or by applying it because it is useful); that power and knowledge directly imply one another; that there is no power relation without the correlative constitution of a field of knowledge, nor any knowledge that does not presuppose and constitute at the same time power relations. (27)

For Foucault, as for Heidegger, knowledge does not originate in the conscious subject, but functions as the framework through which that subject is constituted as the subject of knowledge. For Heidegger, knowledge functions as a way of revealing that reveals man as much as any other object of knowledge. For Foucault it is less a question of movements of revealing than of epistemological structures through which man as a particular configuration is articulated. Moreover, in his meditations on technology and knowledge, Heidegger puts to one side the question of power in so far as he insists that it is principally as a specific mode of knowledge, as *techne*, that 'technology' orders and organises the being of men and technologies in an oppressive and destructive manner.

If, for Foucault, power and knowledge are complexly interconnected, power is not reducible to knowledge. Indeed, Deleuze suggests in his reading of Foucault that power has precedence over knowledge to the extent that, without the forces power regulates and orders, there would be no field over which knowledge might trace out its forms (Deleuze 1988:67). This precedence does not, however, constitute a causal relation whereby power determines knowledge: the relation between the two is one of mutual conditioning. We have seen, in the case of the distributions of bodies and technologies, how strategies of power function in concert with discursive practices set in motion by knowledge. The forces and capacities of bodies are apprehended and distributed by discourse as much as by strategies of power such as training. Moreover, according to Foucault, neither power nor knowledge is at the disposal of the thinking subject:

> these 'power-knowledge' relations are to be analysed, therefore, not on the basis of a subject of knowledge who is or is not free in relation to the power system, but on the contrary, the subject who knows, the objects to be known and the modalities of knowledge must be regarded as so many effects of these

> fundamental implications of power-knowledge and their historical transformations. (1977a:27/28)

Thus, knowledge is not a question of the sovereign exercise of a conscious subject: rather, that subject is articulated and formulated through knowledge as much as through the micro-physics of power. In his investigation of knowledge, Foucault shifts from the mechanics of the constitution of a disciplined social subject and offers a complex explanation of how frameworks of knowledge delimit the parameters within which the specific discourses that apprehend bodies arise, and through which man comes to be figured as he who knows and he who might know himself.

For Heidegger *techne* and *mathemata*, as characteristic of the *Ge-stell*, represent ways of knowing that organise how man understands the world, and organise man himself. Foucault's attention is not directed toward questions of the way man knows, but toward what can be known, how it can be known and who can know it. He is convinced that the structures of knowledge frame man's experience of the world and of himself. He calls these historical frameworks of knowledge *epistemes*. Foucault is much more interested than Heidegger in the connections between modes of knowledge and the operations of the social. He sees that there is an intermediary domain between the fundamental codes of a culture which establish the "empirical orders that man will deal with and dwell within" (1970:xx), and scientific theories and philosophical interpretations which consider in general terms what order is and why it exists. Within this domain between the practical and the theoretical, the particular and the general, he claims it is possible to see the order itself. This order is "most fundamental of all ... anterior to words, perceptions, and gestures" (xxi), which are expressions of it. It is the frame through which meaning is made and knowledge is possible. Order, for Foucault,

is not a question of ontology or revealing, of the movement of being through things, rather it is a historically specific epistemological framework characterising each episteme. In his examination of these orders, he finds defining characteristics that govern knowledge and determine the status of and relation between its objects, including the knower. These characteristics are elaborated and function through what he describes as discursive practices:

> Discursive practices are characterised by the delimitation of a field of objects, the definition of a legitimate perspective for the agent of knowledge, and the fixing of norms for the elaboration of concepts and theories. (1977b:199)

In *The Order of Things*, Foucault is interested in identifying the discursive practices that have traversed particular domains of inquiry and in discerning the underlying frameworks that propel them. The domains he investigates are not strictly defined disciplines, rather they concern the relation of words and things across the fields of life, labor and language, which form the basis of the 'human sciences' in modernity. He undertakes a close examination of how each of these subjects has been apprehended within different epistemes to determine what principles ordered them, in what manner, and to what effect. He traces out, in considerable detail, how things are and what things are across three major epochs in the European past, the sixteenth century, the classical period of the seventeenth & eighteenth centuries, and modernity which arrives with the nineteenth century and persists well into the twentieth. He undertakes an analysis of the frameworks of knowledge operating within each period and the underlying conceptual configurations that support those particular knowledges. Given the length and complexity of Foucault's investigation, it is not possible to detail it in full here. However, in focusing on the account he gives of the emergence of modern man, we will inevitably cover the key methodological and conceptual frameworks he develops.

Modern Man

For Heidegger, technology and modern science were associated with a notion of modernity, which, as we saw in the previous chapter, was less a definitive historical period than the moment of culmination of a particular framework of knowledge, the *Ge-stell*. Foucault, too, is concerned with modernity, but gives a much more specific historical account of its antecedents and emergence. He is interested in tracing the historical movement, not in terms of development or progression, but as the arrival and characteristics of historically specific formations of knowledge, as they are manifest across a range of fields of inquiry. He is not attempting to construct a linear historical narrative, in which modernity is simply the most recent moment, arrived at in a seamless continuity with the pre-modern and classical periods as an evolution or development. Rather, as with Heidegger, he marks modernity less by definite calendar dates that signal its appearance than in terms of a generalised shift in the frameworks of knowledge. His project in *The Order of Things* is, in part, the tracing of the antecedents of the modern in order to discern the nature of the shift through which the modern appears, and with it the type of figures and formations the modern allows.

One such figure Foucault sees as emerging in modernity is 'man'. He concludes that '*man did not exist*' prior to modernity, that he came into being only when a shift in the conditions of the possibility of knowledge, from the classical to the modern, required him as part of the internal conditions of that knowledge (1970:340). Man is central in modernity not due to his position as subject or to any conscious agency on his part, but because he is set there by the operations of the episteme. While there is some coincidence with Heidegger in this perception of the knowing subject as an internal

requirement of a framework of knowledge, rather than the subject as transcendent and existing outside of and prior to knowledge, it seems clear that Foucault's account of man takes place in a different register from Heidegger. In Heidegger's account, the figure of man is considered principally as the site of the mode of Being, of the human. The mode of Being might shift historically, for example with the arrival of the *Ge-stell*, however man remains a relatively stable site, through which to discern the differing modes of being and the different subject position into which he may be drawn. Foucault, on the other hand, is concerned with man as a historical formation generated within particular epistemological fields and, as such, finds him to be a recent and transitory concept.

For Foucault each episteme is characterised by a particular conceptual framework through which a particular understanding of the world is elaborated:

> Within any given culture and at any given moment, there is always only one *episteme* that defines the conditions of possibility of all knowledge, whether expressed in a theory or silently invested in a practice. (168)

Thus, in the sixteenth century, knowledge was founded on the basis of resemblance, but this was replaced in the classical period by representation, while the modern episteme, in turn, arose from the breakdown of representation. Each of these conceptual frameworks give rise to particular configurations of the methods of knowing and the objects of knowledge. To comprehend the historical emergence of man, it is first necessary to outline Foucault's formulations of these historically-specific conceptual structures and their operations; that is, examine how the orders of resemblance and representation function to delimit the conditions of possibility of knowledge. While this

might appear tangential to the question of man and technology, it will provide the necessary background against which Foucault's account of man can be tracked.

In the sixteenth century, Foucault explains, knowledge proceeded within a framework governed by resemblance, where things were understood through relations of analogy, proximity or affinity with each other. Within this framework, the relation between things and language was governed by similitude so that it was through reading the texts of things, deciphering the signs which where part of them, that things could be known:

> The world is covered with signs that must be deciphered, and those signs which reveal resemblances and affinities, are themselves no more than forms of similitude. (32)

Knowledge, in this episteme, was a question of deciphering and discerning the resemblances and relations between things, including the whole semantic field within which they dwelt. Words were not considered as a distinct and subsequent addition to things, but rather they were inscribed in and belonged to the thing itself. This relation between words and things and, with it, the epistemological framework through which things were apprehended and understood, was radically altered in the shift to the classical episteme. It is important to note that, for Foucault, it is through this apprehension and understanding that things are articulated and become intelligible in any age. If he does not focus on the movement of being within things, this is because he is more concerned with how things become known and knowable, rather than with taking up the question on an ontological level. Foucault finds that from the seventeenth century, the system of signs became binary, as the profound kinship of language with the world dissolved. This shift was not restricted to the operations of language, but rather

profoundly altered the very bases of knowledge away from resemblance. The classical system:

> opened up a field of knowledge in which, because of an essential rupture in the western world, what has become important is no longer resemblances but identities and differences. (50)

For Foucault, this shift was propelled by the emergence of what he terms *mathesis*, echoing Heidegger's formulation of the mathematical. While his periodization is at variance with Heidegger, and he is unconcerned with tracing the concept's Greek antecedents, he agrees that, with the arrival of *mathesis*, knowledge becomes organised around measurement and ordering according to differences of degree. Within such a framework, all differences become measurable and can thus be distributed in series based on degree of divergence. Identity is established through a series of increasing difference. In tracking the consequences of this emergence of identity and difference, in terms of how things and signs relate to each other, Foucault finds that representation is the new dominant ordering mechanism. With representation a gap between things and signs emerges, which was not the case in previous epistemes. For example in the pre-classical sixteenth century the description and delineation of a living being proceeded on the basis of the being as connected to the world through a whole discursive network, such that to know it was not just to describe its physical attributes and behaviours, but also its virtues, legends, the food it provided, what travellers might have said about it, etc (129). In the seventeenth century, natural history arrives as a field of knowledge specifically dedicated to explaining the natural world and, with it, Foucault claims a gap appears between things and words. The words which were interwoven with the beast are unraveled and removed, the living thing appears stripped of these becomes articulated through representation:

> natural history ... is the space opened up in representation by an analysis which is anticipating the possibility of naming; it is the possibility of *seeing* what one will be able to *say*, but what one could not say subsequently ... if things and words, distinct from one another, did not, from the very first communicate in a representation. (130)

Representation presumes a distinction between things and words, so that words becomes that which describe things from a distance. Henceforth, knowledge of nature proceeded by way of classification and taxonomy identifying things through formalising and tabulating the differences between natural entities.

Representation functioned in the classical *episteme* to establish a grid of identities and difference, which were compiled in the great taxonomies of the time. While elaborating this field of differences, representation as a mode of knowledge at the same time installed a field of continuity. The co-existence of these seemingly contradictory conceptual frameworks was made possible, according to Foucault, through the capacity of representation to represent itself. That is, each representation of a thing is at the same time a manifestation of the act of representing itself and, at that primary level of the act of representing, a continuity prevails. Thus it is possible to establish a system of differences and identities based on an underlying continuity in which differences are moments of articulation that never, however, escape the field of the continuous, which is that of representation:

> The whole Classical system of order, the whole of that great *taxonomia* that makes it possible to know things by means of the system of their identities, is unfolded within the space that is opened up inside representation when representation represents itself... (209)

I have been focusing on natural history by way of explicating Foucault's account of how the conceptual frameworks of an episteme operate to organise knowledge and constitute the objects of knowledge. He also traces the operations of these conceptual frameworks through the fields of general grammar and labor, where he finds they function along much the same lines as in natural history. From his general survey, he concludes that in the classical episteme there is a fundamental concurrence of the various human sciences in terms of a shared epistemological structure ordered by representation. Moreover, it is on the level of epistemological framework that the shifts and ruptures occur. These bring with them new objects of knowledge and new ways of knowing. Thus when representation can no longer contain or adequately explain, the classical episteme gives way to the modern. This shift is not precipitated by a single momentous discovery made by a 'great man', but rather arises across a range of sites of investigation and scholarship, when questions, methods and findings can no longer be accommodated within the framework of knowledge of the episteme. Modernity, for Foucault, appears with a "minuscule but absolutely essential displacement which toppled the whole of western thought: representation has lost the power to provide a foundation" (238).

For modernity, this displacement occurs when an element of exteriority became apparent. Foucault traces this emergent exteriority in the formulation of biology, philology and political economy as modes of knowledge that overtake natural history, general grammar and the analysis of wealth, of the classical episteme. This is not to say that the knowledges of modernity were developments or evolutions from those of the classical: on the contrary, they would have not been possible in the classical episteme and emerge in the gaps and blind spots of that episteme. The 'incident' which put paid to the rule of representation occurs with the establishment of these new fields of

knowledge. To take biology as an example, Foucault sees the understanding that things had depth as instituting an exteriority to representation. Things moved to the exterior of representation, they possessed a depth inaccessible to representation, belonging only to themselves:

> Withdrawn into their own essence, taking up their place at last within the force that animates them, within the organic structure that maintains them, within the genesis that has never ceased to produce them, things, in the fundamental truth, have now escaped from the table; instead of being no more than the constancy that distributes their representations always in accordance with the same forms, they turn in upon themselves, posit their own volumes , and define for themselves an *internal* space which, to our representation is on the *exterior.* (239)

In the depth of their individual beings, things were exterior to representation and the mode of knowledge that emerged based on this exteriority was characterised by both a metaphysical aspect, concerned with approaching the never fully apprehensible interior 'truth' of things in themselves, and a positivistic aspect, in so far as representation no longer mediated the encounter between the thing and he who knows it; he could now know it as itself.

These two characteristics of modern knowledge reflect the dual status of man, who from this field of knowledge emerges in his unique position as at once an object of knowledge, possessed of an inner depth and singular integrity, and the subject of knowledge, the privileged being who can know things in their positivity as well as know himself. This dual status accounts for a certain position of privilege accorded to man in the modern episteme. However, this pre-eminence of man is not due to his being a prior or transcendent figure: rather, man only finds articulation as such through the operations of the modern mode of knowledge. Foucault finds the emergence of man, and his

relation to the conditions of possibility of knowledge in modernity, a complex matter. While classical thought was concerned with human nature and human entities, man, characterised as an object of investigation and as he who knows, could not have existed in the classical episteme. In that epoch, the concept of human nature was elaborated through a framework that, while distinguishing the human from other natural beings, nevertheless placed them through grids of representation in a relation of continuity. Man was never sufficiently apart that he could be the knower of all things:

> For Classical thought, man does not occupy a place in 'nature' that is granted to him, as to all other beings as a birthright. If human nature is interwoven with nature, it is by the mechanisms of knowledge and by their functionings; or rather in the general arrangement of the Classical *episteme*, nature, human nature, and their relations are definite and predictable functional moments. And man, as a primary reality with his own density as the difficult object and sovereign subject of all possible knowledge, has no place in it. (340)

The human in the classical episteme was articulated through the representational grid that determined a set of relations within nature and objects, which were operationalised in discourse. The human could only be conceived of and operational within this grid of relations, and so a figure such as man, who was exterior to this grid and who could know it, as well as be known, was structurally impossible.

The emergence of man did not provide the impetus for the arrival of the modern episteme and its forms of knowledge, nor did modernity 'create' man as such. The appearance of modern man, according to Foucault, is a complex and intricate process, which defies simple causal explanation. Man is articulated, not only through the various fields of knowledge that take him as an object of knowledge, but equally through the mechanisms by which the framework itself functions. Thus, while man exists only within the parameters of epistemic forms of knowledge, he also proves to be necessary

to their establishment. Foucault claims that, due to man's special relation to finitude, he occupies a central position in the establishment of the conditions of possibility of knowledge. The essential finitude of the human is the aspect of man that sets him, on one level, as the ground for the positivity of all knowledge. In the classical episteme, knowledge was marked by infinity and the delimited objects of knowledge only ever bracketed off and ordered a limited part of an infinity, impossible ever to account for fully. However, in the modern fields of biology, philology and economics, infinity is no longer the horizon on which to etch the boundaries of knowledge across life, language and labour. The positivity of knowledge requires finitude, things must be present in and of themselves, complete and interior, not as artificially partitioned portions of the infinite. Regardless of whether knowledge such as biology or economics is able fully to infiltrate the depth of its objects and so give a complete account of them, there remains a delimited and finite object, which can be known, even to a diminished or incomplete degree, in its positivity.

Man's experience (and ability to know his experience - that is, to take it for an object) becomes defined as an essential finitude, attuned to, and reiterated through, the finitude expressed in the fields of life, labour and language. In life, as articulated in the modern discipline of biology, the forms of bodies act as the limit to activity and experience. In the field of language, as articulated in philology, the historical contexts of the use and function of languages, called forth each time a word is uttered, provides the limitation on language. In the field of labour, as constituted by political economy, the satisfaction of needs sets the limit of production. Finitude is installed within man through knowledge, in the same moment that finitude provides the basis for knowledge. In this way, man not only appears, but appears as ground for the elaboration of the fields of

positivities that knowledge addresses, and through which man is articulated. Thus, while the notion of finitude would appear to describe a bodily reality of man, this is not to suggest that man has an existence independently from the modes of knowledge through which he knows himself:

> In order for man to appear as a specific compound, the forces that create him enter into a relation with new forces which evade that of representation, even to the point of deposing it. These new forces are those of life, work and language ... *These dark forces of finitude are not initially human* but enter into a relation with the forces of man in order to bring him down to his own finitude, and communicate to him a history which he proceeds to make his own. (Deleuze 1988:88)

Finitude is not proposed as a determining ontological condition, but a structure of knowledge, and man knows himself as finite through it. It is in fact the condition of his possibility: man is called into existence in so far as he serves to embody finitude. His position as ground for positivity, based on his finitude, and at the same time he who is called into existence through the frame of finitude, marks him as a unique being, an 'empirico-transcendental' doublet, "since he is a being such that knowledge will be attained in him of what renders all knowledge possible" (Foucault 1970:318). Man then occupies a privileged place in the order of things of the modern episteme, that of the condition of possibility of all knowledge, and at the same time he is articulated only through the knowledges that emerge in that episteme. Thus, while man seems by his subjective ability to know things, and his corporeal facticity to embody finitude – this being thereafter the basis upon which the positivity of knowledge is possible – he is also an object of knowledge, that is, a thing among things to be articulated and determined in the general field of knowledge constituting the modern episteme.

Thus the epistemological orders, through which a figure such as man is elaborated, function to delimit the conditions of intelligibility of objects and of the possibility of knowledge. Within this horizon proceed the micro-physics of everyday operations of power, while those everyday operations of power also shape that horizon. Through the power-knowledge complex, subjects are articulated on a range of levels and through a variety of techniques and strategies: in body-technology meshings, the distribution of bodies across time and space, through the subject's positioning in various institutions, through the discursive practices that delineate the fundamental understandings of the nature and capabilities of man and the world. This relation between power and knowledge is apparent the seemingly double-edged status of the subject: as man and as social subject. On the one hand, the figure of man functions as the subject (and object) of knowledge, and on the other hand, the social and cultural processes of 'subjection', which Foucault describes in *Discipline and Punish*, are directed toward the production and management of social subjectivity. Man intersects with those processes of 'subjection' through the nexus of power-knowledge, such that the figure of man, and his relation to the conditions of possibility of knowledge, informs discourses such as biology, philology and political economy, through which social subjects are in part elaborated. At the same time, as we have seen, the techniques and processes of elaboration of those social subjects impact on these discourses and, as such, inform the manner in which the figure of man is elaborated. In her description of the apprehension of bodies Grosz gives a concise outline of this feedback relation between power and knowledge:

> Power, in its capacity to bring together or to sever words and things, is the condition under which truth can be distinguished from falsehood and truth elevated at the expense of falsehood, error and fiction. But in its turn, knowledge is one of the conduits by which power is able to seize hold of bodies,

> to entwine itself into desires and practices; knowledge devises methods for the extraction of information from individuals which is capable of being codified, refined, reformulated in terms of and according to criteria relevant to the assessment of knowledge. (1994:148)

Man and Technology

For Foucault, and also in one sense for Heidegger, the figure of modern man is a historical occurrence, its emergence intrinsically tied to that of broader contemporaneous configurations of objects, epistemologies and conceptual frameworks. Within these configurations, man is articulated in particular ways and set in particular relationships with other elements, including technologies. While Heidegger is more concerned with the ontological status of man, that is, his mode of being within specific frameworks, Foucault traces the emergence of man, as both the subject and object of knowledge, within a particular epistemological order. Heidegger directly investigates the question of technology in terms of how it is framed in the particular configurations of knowledge from which such a configuration of man emerges. For Foucault, technologies need to be considered as they intersect with everyday practice and the strategies of power and orders of knowledge that underpin such practices. While Heidegger and Foucault pursue the articulation of Man and technology in different registers, what emerges from consideration of both is a broad understanding of the historical contingency of man and the complex intermeshing of technologies and humans within the conceptual frameworks that articulate both man and technology. Such an understanding problematises simplistic accounts of technology as instrumental. Technology is intimately tied to man, not simply at the surfaces where machines and tools touch bodies, although this interface is by no means insignificant since Foucault has clearly shown that power and knowledge are deeply embedded and operational at this level. However, both insist that the everyday meetings of bodies and technologies

point to a more fundamental encounter between technology and human beings in the domain of knowledge and power. Modes of knowledge and strategies of power do not merely operate 'on' individuals and technological objects, but actively constitute them as subjects and objects, delimiting them and outlining the context and scope of their interrelations.

Foucault's refusal of an instrumental explanation of technology derives in part from his insistence that power-knowledge relations pervade and shape social and cultural practice. It also emerges from his explicitly anti-subjective approach to power and knowledge, which directs his analysis to the encounter between bodies and technologies, as opposed to thinking subjects and technologies. This anti-subjectivism can equally be seen in his broader understanding of knowledge, which contends that the knowing subject is articulated through the frameworks of knowledge, rather than being their source. This displacement of the subject is also developed by Heidegger. A particular understanding of man as knowing subject is articulated by both thinkers, with different inflections, but coinciding on two crucial points. Firstly, both offer accounts of the constitution of a subject of knowledge, distinguished from the field of objects and in relation to which all objects are subsequently elaborated. Man becomes the knower of objects and, as such, they are distributed in a relation to him. Secondly, man himself is an object of knowledge, but one which he himself can know – that is, man as self-aware, self-conscious subject – and as such he comes to occupy a singular position as guarantor of the positivity of knowledge. Heidegger, in his analysis of the mathematical, and Foucault, in his examination of the human sciences of modernity, both find that the elaboration of the figure of man as self-aware subject functions as the ground for the self-evidence and positivity of knowledge. It is through this gravitation of man to the

centre of knowledge that the subject/object distribution emerges as a fundamental mode of articulating the relation between man and things. This framework provides the context and accounts for the common-sense explanation of technologies as objects, after the manner of tools or machines in an instrumental mode. Once one moves beyond this 'correct' level and inquires into the conditions of the emergence of the subject, as do both Heidegger and Foucault, albeit along very different trajectories, then a new horizon appears within which to examine the field both of objects in general and of technologies in particular.

Clearly, Heidegger and Foucault offer differing accounts and approaches both to man and to technologies. My aim in considering both is not to use one to critique the other, or to force a convergence between them, but rather to sketch out a horizon within which to pursue the question of human-technological engagements and from which to investigate the possibilities of transformation that may or may not be generated from these engagements. What emerges is an understanding that neither the human nor the technological stands outside the frameworks of knowledge and operations of power that permeate the social field in which they encounter each other. These configurations are historical and they do not arise through any single act of human agency, individual or collective. They delimit what counts as human, what a subject can do, and into what relations a subject can enter with other entities or objects.

What approach, then, does such an understanding suggest for feminists assessing the transformational possibilities of particular technological formations? I would claim that it both demonstrates the necessity for transformation to take account of the question of knowledge and offers an indication of how technologies might be involved in

facilitating such a transformation. Foucault's accounts of the moments of transformation between one episteme and another in *The Order of Things* suggest that what is required to evaluate the transformative possibilities of technologies is an examination of how particular technologies and human-technological arrangements are understood and function, according to the conditions of an episteme, and whether they give rise to new forms that cannot be contained within that episteme. He gives the example of Cuvier, the biologist who, with the assistance of the technologies of dissection and x-rays, developed an understanding of objects as possessed of depth, stressing the conceptual categories of the classical episteme. However, it is not a case of a new technology being used by a subject to enact a pre-conceived transformation. Rather, Cuvier conceptualised and pursued his project, and x-ray technology appeared, within the framework of the classical episteme, which subsequently could not adequately account for the unforeseen outcomes of its use. In this manner, the framework was rendered untenable and another emerged that could contain and explain, not only Cuvier's biology, but also similar conceptual shifts across the human sciences. Thus, it is not technology in and of itself that can effect change, but rather it is a confluence of technologies, epistemologies, institutions, and methodologies, which resonate across the entire framework of knowledge. And, as we saw with the emergence of disciplinary training techniques, everyday practice intersects with knowledge in giving rise to new configurations. For Foucault, man arose through just such a shift and will probably dissolve through one. As Deleuze notes:

> We must take quite literally the idea that man is a face drawn in the sand between two tides: he is a composition appearing only between two others, a classical past that never knew him, and a future that will no longer know him. (1988:89)

For Foucault, such historical ruptures and transformations of frameworks of knowledge, social practices, and distributions of power suggest that the movement of change is inevitable. He does not, however, believe that change proceeds along the enlightenment lines of progress toward a utopian state. Indeed, it may be that more refined and ubiquitous modes of order and control arise. But he does concede that, while pervasive and dominating, such regimes are never fully stable and must be continually maintained through the containment of what exceeds them. This containment is, of course, the explicit purpose of the macro-institutions of prison, the asylum, the school, though it equally informs the myriad of micro-physical everyday practices. One such site of excess is, for Foucault, the body. While he insists that the body is the object of struggles and the site of materialisation of power, this does not necessarily imply that it is fixed entirely in perpetual servitude. Rather, it suggests a pliability of bodies, their potential to bear a vast number of meanings and functions, which never fully apprehend or contain their flows and forces. Clearly, such an understanding of bodies can be useful to feminists and, as we shall see in the next two chapters, the question of bodies is implicit in feminist transformative projects, including those which look to technology. While bodies might be excessive, as Foucault has argued, to the extent that they remain embedded in the matrix of power-knowledge, and embodied subjectivity articulated through that matrix, transformative projects must always address these sites. It is here that man might be transformed and also, as Deleuze points out, that technologies might possibly participate in this transformation:

> Is it not commonplace nowadays to say that the forces of man have already entered into a relation with the forces of information technology and their third-generation machines which together create something other than man, indivisible 'man-machine' systems? Is it a union with silicon instead of carbon? (1988:89)

In the next chapter, we turn to the question of woman and technology, which has been in abeyance throughout my consideration of Heidegger's and Foucault's accounts of technology and man. My purpose in these initial two chapters has been to sketch out the conceptual horizon within which to pose the question of technology and thus to identify the basis on which transformation might be sought. That done, I want now to take up explicitly the question of woman and investigate feminist engagements with the technology-knowledge matrix, which has given us these modern configurations of both man and technology.

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[1] Even Grint & Woolgar's analysis which critiques patriarchy as an over-arching organised system in the service of men's interests and proposes instead that technologies are gendered in the process of their interpretation during the design, development and use stages, ultimately reiterates this instrumental understanding of technology inherently serving some interest in that the act of interpretation which inscribes gender into technologies is seen as one in which technologies are understood and used by some agent, or collectivity of agents, to the benefit of some and the detriment of others.

[2] There have been many feminist engagements with Foucault, particularly in terms of considering the relation between power and gendered subjectivity: see Judith Butler (1993) *Bodies That Matter. On the Discursive limits of Sex*; and Teresa De Lauretis (1987) *Technologies of Gender. Essays on Theory, Film and Fiction* in particular. My interest here is not gender per se, but rather the way in which knowledge and power intersect in the social field in a constitutive manner.

[3] In this chapter, the term technology is used to refer to technological objects and processes, and not in the sense of Foucault's 'technologies of the self' which refer to strategies, organisations, and practices which work to constitute particular subjectivities.

[4] This is a point which Butler develops at great length in her studies of how bodies are sexed through gender performance, rather than naturally sexed bodies being the foundation onto which gender is inscribed. For an introductory outline of her claims regarding the relations of sex to gender see *Bodies that Matter* (1993) pp 4-12.

Chapter 3

Woman and Technology

Perhaps, ironically, we can learn from our fusion with animals and machines how not to be man, the embodiment of Western logos.

Donna Haraway. *Manifesto for Cyborgs*

In the previous two chapters, I examined in some detail the historical nature and specific formulations of the figure of man as elaborated through modern frameworks of knowledge. It is within such frameworks of knowledge, I argued, that the basis of man's relation to technology could be discerned. Furthermore, such frameworks are, as Foucault shows, integral to the arrangements and operations of power, as it traverses and orders the social, and to the articulation of social subjectivity as it occurs within a power-knowledge matrix. In making a distinction between men and man, and by association women and woman, it becomes possible to discern the multiple sites that require feminist investigation. Operations of power pervade and organise the everyday practice of men and women in the social field, and discourse functions in conjunction with strategies of power to describe and order the experiences of men and women as specific social subjects. Specific discourses – such as science, medicine, and education, which work to distribute and regulate bodies in everyday practice – are elaborated within the parameters of generalised frameworks of knowledge and indicate how knowledge functions in concert with strategies of power. As Foucault explained in *The Order of Things*, a framework of knowledge functions as the condition of possibility for knowledge, establishing the conditions through which both the objects and subjects of knowledge are elaborated, and the relations between them established. Moreover, it is here that man is articulated as the privileged subject of knowledge and the field of objects set in a relation to him. On this basis, I would claim that a feminist consideration of transformation, including those focussed on technology, must address not only the activities of men and women, but the categories of man and woman.

Modern Woman

In both Foucault and Heidegger, we find accounts of the historical emergence and elaboration of the figure of man as the pre-eminent object and subject of knowledge. Moreover, we saw how man came to occupy the subject position of 'I', not by virtue of a transcendent being or conscious act, but due to the exigencies of prevailing historical modes of knowledge. It is on this basis, I would argue, that we need to raise the question of woman and, in order to pursue the principal concern of this project, feminist transformative aspirations and technology. One seemingly obvious response to the figure of woman is that she is equally articulated as a subjective "I" within the prevailing arrangements of knowledge and power. If this is the case, then her status requires no further comment beyond the assertion that man signifies not just men, but the figure of the generalised human. The figure of man thus contains that of woman and any differentiation in status occurs on the secondary, though by no means trivial, level of the social. Any disparity between the two can therefore be redressed through political action and social reform. However, feminist interventions into philosophy and epistemology have noted that there is a great deal more at stake in designating subjective man as the marker of the human. The uncritical subsuming of woman into the generalised realm of humanity, marked by man, is in itself a very particular epistemological gesture which has far reaching consequences in terms of determining the status and function of woman.

Having noted the constitutive role frameworks of knowledge play in delimiting the scope of man/technology relationships, clearly an examination of the relations between woman and technology requires consideration of the question of woman and knowledge. That is, we must arrive at some understanding of how the modes of knowledge, through

which man is articulated, elaborate woman and from there proceed to questions of technology and transformation. If I have deferred the question of woman in my readings of Foucault and Heidegger, it is because from the outset I wanted to approach it in a feminist context and so begin with the work of Luce Irigaray, who is expressly concerned with the status of woman in the frameworks of knowledge that constitute man as subjective 'I'. In the second half of this chapter I will return to the question of technology and examine two feminist accounts of technology that take up the insights offered by Irigaray. Both Donna Haraway and Sadie Plant have attempted to theorize post-modernity as an alternative and emergent mode of knowledge within which woman's status is radically refigured, in large part due to a shift in epistemological categories propelled by a new generation of technology.

Irigaray – Woman and Man

> We can assume that any theory of the subject has always been appropriated by the masculine. (Irigaray 1985:133)

If in modernity the human is formulated as man as subjective 'I', the question feminism asks is 'how is woman configured within this particular arrangement?' That is, how is woman articulated and delimited within the model of subjectivity man occupies? Irigaray offers a response to these questions through her critique of the formulation of the subject in the Cartesian cogito and the discourses of psychoanalysis. She finds that the elaboration of the subject as man proceeds through very specific arrangements of power, discourse and knowledge, which equally elaborate woman along particular lines. In her analysis we find not just the uncovering of the epistemological framework through which a certain understanding of woman is articulated, but also the identification of the conceptual foundations that support man as subjective 'I'.

Like Heidegger, Irigaray finds that the subjective 'I' serves as the ground against which objects are articulated and in relation to which they are ordered. However, in likewise refusing any transcendent or ontological explanation of the articulation of self-conscious, self-identical man as 'I', she claims that this subject position can be maintained only on condition of the objectivity of all other entities and things. It is not by virtue of man's position as self-referential knower that the world is designated as so many objects of his knowledge, but rather it is through the process of designation of the world as objects that the subject which knows finds articulation. Woman, Irigaray argues, is the first of such objects and thus cannot herself, within this economy of knowledge, occupy the subject position. I want to trace her elaboration of this argument along two interconnected lines of analysis: firstly, her examination of the conditions under which the cogito functions as the mechanism of self-presence and self-identity of the subject; and secondly, her reading of psychoanalysis which explores further the question of sexual difference and subjectivity.

In the formulation of the cogito, which proceeds via the movement of the 'I think' as the basis of a self-present, self-identical subjectivity, Irigaray finds a movement of severance from all other entities and things, in an attempt to secure the self-representational purity and certainty of the 'I'. Within the cogito the only logical certainty is the thinking 'I', arrived at though the process of doubting, which functions to quarantine that 'I' from all entanglement, corruption, or debt to any object (of thought). Detached from the world of objects the 'I', through the movement of thinking/doubting, functions as its own creator and the guarantee of its own presence:

> Everything can be put in doubt, (it is) I (who) doubt(s), therefore (it is) I (who) am. The relation to the universality of being of the thinking and speaking "I" is then assured. *Undoubtedly*. (181)

In the process of doubting the subject arrives at the proof of existence by being unable to doubt that it is doubting, in an act of self-reflection that claims to be entirely self-contained. In a self-reflexive movement of thought that thinks itself, the subject represents itself to itself as self-present and self-identical and thus independent of any external object of thought. Irigaray rejects the possibility of any such complete detachment. She contends that the claim for an entirely self-reflexive movement of doubting conceals a constitutive relationship with the object. Moreover, this dependency is necessarily disavowed since to acknowledge it would render impossible any claim to self-identity. It would amount to an admission that the identity of the subject is, at the moment of constitution, reliant on and thus contaminated by that which is supposedly exterior to it and thus could not be entirely self-referential:

> what is now founding the subject's existence and reflection works like the backing of a mirror that has been introjected, "incorporated", and is thus beyond perception, it can barely be intuited... (181)

She finds that self-reflection or doubt is itself an operation that, while seemingly the transparent movement of pure self-presence, is in fact the product of representational and material processes. In her examination of Irigaray's critique of western metaphysics Claire Colebrook traces this setting of materiality as the forgotten or repressed other of the cogito and finds that Heidegger's critique of the cogito as mathematical and axiomatic provides the initial impetus for Irigaray (1997:85).

For Heidegger, as we saw in chapter one, the cogito proceeds through the operations of the mathematical, as a mode of knowledge in which the world is apprehended only in terms of that which is already known. In the cogito, according to Heidegger, the subject is that which thinks itself and, thus, thought becomes its own ground in an axiomatic manner. The cogito turns on the movement of self-representation of the subject to itself. In this sense it is mathematical, since the subject already knows beforehand what it finds in thinking itself. According to Colebrook, Irigaray focuses her critique on the mathematical representational framework through which objects, and being in general, are apprehended only through the framework which sets them before the subject (85). In this formulation a relation of representation is introduced as the basis of knowledge, whereby objects are not directly encountered in themselves, but are known through an act of representation, in which objects are represented to thought through the medium of 'what is already known', the mathematical. Within the mathematical framework, thought already knows itself and thus represents itself to itself. Colebrook explains that, for Irigaray, thought within the mathematical can only represent itself on the condition of forgetting a materiality that grounds the act of representation:

> Thinking can only coincide with itself if it takes a detour through representation, but that detour or medium remains (must remain) unrepresented... For Irigaray... this medium of representation is the maternal body. The unrepresentable ground is, for Irigaray, the formless, nonideal chaos of the corporeality of being. (87)

Materiality is, for Irigaray, a chink in the edifice of self-presence and self-representation as the ground for the subjective 'I'. She finds in the cogito a movement of disavowal of the material, in so far as the subjective 'I' must be set apart from the matter of the body, in order that it sustain the axiomatic claim of being the origin of itself. She sees that the

materiality of bodies brings an undeniable maternal inheritance. That is, the very fabric and fact of bodies owes a debt to the productive force of maternity. Thus the mother, as other, is always already present in the very matter of the thinking subject. This materiality and its inextricable relation to the other are, for Irigaray, the condition of possibility from which the cogito proceeds:

> What if I thought only after the other has been inserted, introjected into me ... And if the thought that I have received from the other, or the others, are put into doubt by a solipsistic gesture which already calls its own validity into question, the fact that the mechanisms of thought and the "thinking tissue" are necessarily constituted by the other... (1985:183)

The subjective 'I' that thinks is founded on a fundamental denial in which the material sensations and perceptions that are subjected to doubt, against which the 'I' can know itself as doubter, are cast as objects against which the subject is isolated and uncontaminated. In this denial it is maternal corporeality that is the first object, as it is necessary to deny the maternal origins of the matter which thinks, in order that thought thinking itself becomes the locus of being. Thus, for Irigaray, the world of objects is always already implicated in the subject and the notion of self-identical and self-contained subjectivity can only be sustained through its disavowal and the elaboration of a strict demarcation between subject and object. Having proposed that the maternal is the first of such objects, she contends that this denial and 'objectification' of woman can be traced across a whole range of discourses.

Irigaray finds in the psychoanalytic account of the acquisition of social subjectivity an exemplary demonstration of the processes of the exclusion of woman from the position of subjective 'I'. She contends that the mode of social subjectivity described by Freud

(and Lacan) offers no account of woman other than as 'not-man'. Moreover, in the acquisition of this social subjectivity she finds an account of the process whereby woman once again becomes the 'matter' – the object – against which a masculine subjectivity constitutes itself. Psychoanalysis describes a scenario in which, by identifying the woman's body as castrated and renouncing the attachment to the (m)other, the boy acquires the 'I' of social subjectivity. In repressing his desire for the mother, the unconscious is formed and the boy is able to identify with the father and thus assume the position of social subject. Thus the boy's subjectivity is founded on the sacrifice of the maternal body, as well as on the sacrifice of a relation to his own body. In this process, woman functions as the 'object' of masculine desire, which must be repressed in order to become subject. As such, she is excluded from subjectivity in order that the masculine subject can occupy that position:

> Subjectivity denied to woman: indisputably this provides the financial backing for every irreducible constitution as an object: of representation, of discourse, of desire. Once imagine that woman imagines and the object loses its fixed, obsessional character. As a bench mark that is ultimately more crucial than the subject, for he can sustain himself only by bouncing back off some objectiveness, some objective. (133)

It is not only this requirement to serve as object to the male subject that precludes woman attaining subjectivity, but also her inability to distinguish herself from the field of objects. To the extent that it is impossible for woman to deny the mother, because she recognises the castrated mother as the same as herself, she cannot completely objectify the other. Thus, Irigaray contends, according to Lacan, masculine subjectivity is only possible on the condition of a clear cut distinction between subject and object (of desire), between self and other, which only man can make. Such a distinction is possible only if the object is expelled as external and alien to the subject. The object is

thought only in so far as it serves to establish and maintain the position of the subject. Thus, for Irigaray, the masculine subject is one "in whose sight everything outside remains forever a condition of making possible the image and the reproduction of self, a faithful polished mirror, empty of altering reflections" (136). Where woman remains the primary object against which the masculine subject asserts his position, there is no avenue within this economy to articulate her as subject.

Irigaray contends that such a distribution of man and woman to opposite sides of the subject/object division does more than deny woman subject status: it effectively erases her as woman. She finds that what is required for the establishment of the subject, as man, is not simply a distribution of the world along subject/object lines, but the refusal of any autonomous status for those objects. In order to sustain the self-presence of the subject, all objects must not only be detached from him, but also thought only in terms of their relation to him. In such a relation, objects are not possessed of any independent and specific status in and of themselves and as they are described only in terms of their differences and divergences from the subject, are simply not-subject. As we saw in Irigaray's (and Heidegger's) critique of the cogito, the subject becomes that which determines the object, in so far as it elaborates a field of subject/object along the lines of the mathematical. Within such a field, according to Colebrook, "being is thought in terms of what can be known, or presented and what can be set before the subject" (1997:86). As such, objects/beings are thought through a generalised notion of being as something that can be known by the subject. Thus, the subject is that in relation to which all objects/beings are figured only in terms of how they stand as objects of knowledge (and doubt) and, as such, are denied any specific being independent of the subject.

At the basis of the subject/object relation Irigaray identifies a logic of binarism that functions along the lines of A/-A. In such a logic all difference is thought only in terms of the principal term of the pair, as its absence, as divergent from it, as degree or variation, rather than the subordinate term being possessed of any autonomous specificity. As such, the logic of the binary is symptomatic of what Irigaray terms the 'economics of sameness', which grounds claims of self-identity. Within such an economy all difference is articulated only in a relation to the same: as *difference from.* Thus, within the man-subject/woman-object framework which characterises the discourse of psychoanalysis, woman is not accounted for in terms of her own specificity, but elaborated in reference to man – that is, as castrated and marked by absence and lack. Moreover, in an economy of sameness the specificity and autonomy of the other is not simply rendered irrelevant, but actively repressed in order to maintain the framework itself. Thus, Irigaray finds that, in the logic of self-identity though which man is articulated as subjective 'I', not only does woman not have access to subjectivity, but her existence as woman is also in no way accounted for:

> Even in the silence of the other who says nothing (but) what the 'subject' has already told her to say. The 'subject' will thus be able to exploit the other, fragment her, speculate her - and will find in her nothing but the same sameness? This male other will serve only to duplicate his own identity in a different way. (1985:235)

How, then, are feminists to proceed in redefining the status of woman when, in the very conception of the subject as 'I', woman cannot be accommodated or even thought in her specificity as woman? For Irigaray, it is not a question of simply gaining access to the position of subject for woman. Indeed, on her understanding this is not possible,

because the very framework, through which that subject position is elaborated, is predicated on the exclusion of woman, and thus to occupy it is to become man. For Irigaray, sexual difference is of the order of an irreducible difference in kind, which is obliterated in the operations of the economy of the same. What is required in order to begin to articulate such difference is an epistemological shift, whereby the binary structure that articulates subject against object in an economics of sameness is displaced. Some means of expressing difference other than in terms of the same – that is the A/- A model – is necessary. For woman to be thought in her own specificity, and not simply as not-man, a conceptual framework is required that can recognise difference in terms of differences in *kind*, irreducible to each other. As Irigaray has shown, such a concept of difference is impossible within the binary logic of the economics of sameness that is the ground for self-identity.

While the logic of the same is pervasive, Irigaray sees it as fundamentally unstable: the apparent stability of self-identity is always troubled by the excessiveness of the other. The object is always in excess of its designation as not-subject, woman is always more than castrated and lacking. Indeed, for Irigaray, bodies are a particularly excessive and destabilising force, disruptive to the self-identity of man as subjective 'I'. Moreover, Irigaray claims that the subject/object ordering gives rise to a whole set of supporting relations, one of the most significant being the mind/body division. This mind/body distinction is crucial to the process of 'I think', since it is through this division that the 'I' can disavow any relation to the materiality of the thinking processes and the maternal origins of the thinker. The materiality of bodies, for Irigaray, undermines the cogito at its very ground. Likewise the bodies of women, clearly in excess of the designation of castrated man, present a site of disruption to the discourse of psychoanalysis. Bodies

become a significant site for feminist theorising and practice, as the inability of binary logic to articulate or contain the irreducible difference of sexed bodies continually threatens the stability of identity as formulated through that logic. It is this self-identity and the structures that support it, as they are elaborated and maintained through discursive fields such as psychoanalysis, but also, as we have seen, the very mode and nature of knowledge in modernity, that require transformation. Moreover, bodies and their interminglings with technologies become one of the key sites to which feminists bring the question of technology and transformation. In this context it is not, however, a question of how women might use new technologies to instigate change. Rather the question becomes: 'do new technological formations offer feminists any avenues for intervention into those epistemological structures and discursive practices through which modern knowledge is elaborated?'

Technology and Women

If a shift is required in frameworks of knowledge in order even to begin to apprehend woman outside of the conceptual economy of identity, on what basis might technologies participate in instigating such a shift? As I have shown, technologies are articulated through the frameworks of knowledge and power that elaborate man. However, an increasing number of feminist thinkers are interested in whether electronic information technologies might precipitate a groundswell toward an epistemic shift. Information technologies are commonly perceived to be of another order to the industrial technologies of modernity. Feminists are interested in how new technological configurations might stress and disrupt modern categories of knowledge, especially the discourses that elaborate the category of the human. Through this challenge to the

human, an avenue is sought to dislodge man as subject and shake the edifice of identity and modernity itself.

Sadie Plant and Donna Haraway, for example, both register the crucial importance for feminism of moving beyond the horizons of modern knowledge. They have pursued the possibility of the emergence of a post-modern and post-human episteme, wherein the supersession of the frameworks of modern knowledge will allow an epistemological space conducive to the elaboration of other modes of subjectivity, including sexually differentiated ones. Both Plant and Haraway consider information and communication technologies to be valuable accomplices, if not the chief instigators, of such an epistemological shift. Both take a very different view of technology to constructivist understandings of technology as 'masculine culture'. They diverge from constructivism on a whole range of issues, but most fundamentally in that they both suggest that technology, in strategic alliance with woman, can function to disrupt the masculine economy. This alliance they see as being forged on the conceptual and representational horizon, as well as in the everyday engagements between women and emerging technologies. In charting what they identify as the fall out of technological and theoretical development in stressing and possibly displacing the frameworks of modernity, both Plant and Haraway take up the task of rethinking the intersections between technology and women from the perspective of woman.

Sadie Plant – Woman as Technology

> [In modernity] technology itself was supposed to be a vital means of exerting this explanatory and organisational power. But the revolutions in telecommunications, media, intelligence gathering, and information processing they unleashed have coincided with an unprecedented sense of disorder and unease, not only in societies, states, economies, families, sexes, but also in

> species, bodies, brains, weather patterns, ecological systems. There is turbulence at so many scales that reality itself seems suddenly on edge. (Plant 1998:45/46)

Sadie Plant sees the challenge to man arising on a myriad of fronts, but most prominently from technologies, woman and the coalition of the two. She contends that digital information and communication technology have a pre-eminent role to play in dislodging man as subjective 'I' and displacing the economics of identity. She focuses her investigation on the shifting relationships and hierarchies in man/woman/technology arrangements, which she argues are radically recast by the emergence of digital technologies. In *Zeros + Ones* she traces a field of connections between digital technologies and both woman and women, which ranges across both theoretical and practical domains. She wants not only to demonstrate the diverse modes of connection between technologies and women, but also to indicate the multiple sites of challenge that technologies, women and woman present to man (and men). For Plant, the end result of the cumulative challenges presented by this alliance is a breakdown of the discourses and categorical frameworks of modernity and the emergence of a new post-modern episteme.

Technologies, according to Plant, are central to any such shift. She perceives digital information and communication technologies to be of an other order, radically distinct from the industrial technologies of modernity. For Plant, these technologies herald the arrival of a post-industrial, post-modern epoch which marks not only a shift in the industrial economic base of society, but also a conceptual shift that renders untenable the figure of man as 'I'. [1] The challenge posed by digital technologies is most clearly apparent in the emergence of neural computing networks and the distributed information systems of the internet. She claims that these present a two pronged hazard for man:

firstly, on a theoretical front to man as organic unity; and secondly, on a material front to men as dominant over women in everyday social, economic and cultural life. Further, these are closely aligned to the challenge presented by woman. Plant, following Irigaray, sees woman as excessive and, in her very existence, disruptive of binary structures. Technologies, according to Plant, equally disrupt the logic of identity and it is the lines of intersection between woman and new technological configurations that she is interested in mapping. To this end, she claims that emerging technologies share a particular affinity with woman, and women, which she charts across a range of practices and discourses. She identifies three major points at which this affinity can be discerned: firstly, in historical structural alignments between technologies and women; secondly, where technologies exceed the logic of identity, as does woman; and thirdly, the coincidence in modes of operation in everyday activities of women and technologies.

On the first point, Plant moves to reclaim a place for women in what Grint and Gill described as the masculine culture of technology. She traces the history of women in the workplace, detailing how they were relegated to menial repetitive tasks, but ones which often concerned information processing and communication networks. These include women's work as weavers, typists, telephone exchange operators, and calculators of numerical data – an occupation termed 'computers' at the time and a literal example of the affinity Plant is attempting to establish. She also traces the involvement of women in the development of computer programming. She wants to rescue and reinstate the presence of women in the development and operation of technologies, particularly those concerned with information processing and communications. In this way, she refutes any model whereby technology is in its nature masculine, or exclusively the province of masculine culture. Rather, she demonstrates

that women were (and are), even if not immediately visible, very much engaged in technological development and practice, particularly in the information processing arena:

> Theirs is not a subsidiary role which needs to be rescued for posterity, a small supplement whose inclusion would set the existing records straight; when computers were virtually real machines, women wrote the software on which they ran. And when *computer* was a term applied to flesh and blood workers, the bodies which composed them were female. Hardware, software, wetware - before their beginnings and beyond their ends, women have been the simulators, assemblers, and programmers of the digital machines. (37)

Plant sees that the current practice, whereby women in the developing world work in the microprocessor plants of multi-national computer corporations, as the continuation of a historical relation through which women have been closely involved in information technology. Having established that women were by no means absent from technological culture, Plant extends the range of their connection to information processing systems by proposing a shared status as disruptive to man. More than simply staking out a place for women in the development of these technologies, she claims a deeper affinity, particularly with the computing technologies of the late twentieth century. It is the mode of operation of these technologies, as non-centralised, diffused, non-linear and in constant relations of connectivity, which she finds to be of another order to modern industrial technologies, with their rigidly determined operational parameters, stand-alone physicality and linear top-down structures of operation. Moreover, for Plant, this is not just a distinction between different types of technologies, but between frameworks of representation and knowledge - the mobile and diffuse, as opposed to the bounded and fixed. Where man emerged in his current form through a framework of representation that worked toward stability and fixity, such new

technologies, she claims, are inimical to that form. If man, in modernity, was characterised by the attempt to fix stable bounded categories and achieve transparent self-identity through a linear, logical process of thinking the world into subject and objects, then Plant considers the mobile and fragmented nature of new technologies as severely disruptive of such attempts:

> Neural nets have less to do with the rigours of orthodox logic than the intuitive leaps and cross-connections once pathologised as the hysteria of a thinking marked by associations between ideas...(173/4)

Plant's reference to hysteria is not coincidental: she is invoking the figure of Irigaray's hysteric. The figure of the hysteric, for Irigaray, is not pathological; rather, it is she who exceeds the elaboration of woman as not-man and figures her body and sexuality in modes not permissible within the orthodoxy of woman as lack, absence, not-man. For Plant, woman is excessive and presents a challenge to man, she is mobile and fragmented as opposed to fixed, singular and contained. As such, Plant contends that woman shares an affinity with the new technologies, which are themselves "not unified entities, but hives or swarms of elements, interconnected multiplicities, packet switching systems of enormous complexity which have no centralised government" (167). Thus woman, who threatens man by exceeding his logic, is akin to computer and neural networks, with their diffused and decentralised modes of information exchange, which do not require linear logic and centralised control.

Having claimed that man's elaboration, as configured through the ordering logic of binarism, is under siege by new technologies, Plant further insists on the conjunction

between women and these technologies. She claims that, over and above technology and woman sharing a theoretical excessiveness, the two are also akin in another register: women's everyday practices proceed in a manner that equips them to engage in associative distributed patterns of information processing analogous to emerging information systems:

> There is always so much, too much, and too many different things to do, so many tasks to juggle and perform: making lists and notes, taking stock, keeping track; parallel processing, flipping between functions at the cry of a child, the ring of doorbell, a sudden flash of dream sequence; distributed systems, adaptive networks, scattered brains. (106)

Not only do women's daily activities make them more akin to emerging systems, but this mode of information processing is also actively detrimental to man. New modes of communication and information processing, which are equally operational in digital technologies and women's everyday practices, present a threat to the mode of communication in which absolute representation and linear logic function to ensure man's self-representation as the subjective 'I'.

Thus man and men are poorly equipped to engage with the new modes of information processing and networks of communication increasingly influential in the late twentieth and early twenty-first centuries. Women and woman on the other hand are, by virtue of women's everyday practices, and the excessive nature of woman, already operating in this very mode. Plant sees this alignment as productive for feminists on a number of levels. It not only reclaims technologies as the province of women, but also marks them as disruptive and destabilising and thus serving a common purpose with woman. Moreover, Plant contends that these technologies will ultimately undermine the frameworks and modes of knowledge which articulate man and which govern the way

men think and function in the everyday. For Plant, as these technologies become more powerful and pervasive, women by virtue of their association and kinship with them will likewise rise to prominence. Thus, not only do information processing technologies trouble man, in so far as they are developing modes of operation that put stress on his representational framework, but they are also aligned with woman by virtue of their historical association and modes of operation. This alignment marks these technologies as excessive, resistant and ultimately destructive of singular identity. In forging such an alignment, Plant is feminising technologies to the extent that they present the same challenge to man as Irigaray has suggested woman does.

While such a reading of emerging technologies seems to mark them as a productive site for feminist transformative projects, it is necessary to consider whether Plant's elaboration of this multi-level alignment between women, woman and technology achieves the aim of radically reconfiguring the epistemological frameworks of modernity. I would claim that, while she offers some intriguing insights into how new modes of information processing and communication might pressure modern conceptual frameworks, her attempt to integrate these technologies with woman and women, across both the theoretical and material, remains problematic. Principal amongst the concerns raised by Plant's formulation is the seamless slippage between man and men, woman and women. She takes as synonymous the everyday activities of women and the theoretical elaboration of woman, in such as way as to leave unexamined the networks of power and knowledge within which both are formulated and operate. As Irigaray has shown, woman as articulated in the economy of identity does not and cannot contain women – particularly their embodied experience. If woman as not-man must be refused, this is not simply a question of a shift in focus to the activities and experiences

of women. While the category of woman might be unable to contain the totality of women's experiences, as Foucault has shown, everyday experiences and positions of women remain, nonetheless, intertwined with the discourses and categories which elaborate woman as a figure of knowledge. To the extent that Plant wants to validate certain experiences and understandings of what women do – think in non-linear modes, multi-task etc. – she is supporting an understanding that is elaborated through a power-knowledge matrix informed by a logic of identity. She accepts uncritically attributes which have been historically attributed to women in a social field where they are subordinate and devalued, and leaves unchallenged the position of woman as opposite of man in the epistemological field. Plant can therefore forge her alliance only within the frameworks she seeks to dislodge.

In making a conceptual leap from women's corporeal excessiveness to the category of woman as challenge to man, to claiming women's activities in the everyday as disruptive, she obscures the embeddedness of women activities and bodies in relations of power through which women are devalued. The entire fabrication of her woman/technology analogy is predicated on a reading of women's practices in an oppositional relation to mens. In positioning as exemplary the weaver, typist, computer – women as more dexterous and better adapted to multi-tasking – she elaborates an understanding of women as that which men are not. Women are agile in the face of his rigidity, fluid in the face of his fixity, distributed in the face of his locatedness. Reminiscent of eco-feminism, though with obviously different attitudes toward technology, Plant is marking particular qualities and practices as 'feminine', or the historical province of women, in an essentialist manner. Her transformative project then becomes to re-value these traits, by associating them with the new generation of

technologies so as to tip the balance of the binary structure. While this positive emphasis may work towards devaluing men's activities as dominant, and on that basis challenge a logic premised on men occupying the dominant position, it does not in itself displace the binary or offer an alternative epistemological framework. Women remain articulated in their differences *from* men; these differences are simply re-valued.

Such a valorising of the other side of a binary in no way dissolves the structure itself, nor does laying claim to possession of the instruments of power, in this instance information technologies. Such strategies simply move woman to the other side of the binary, giving her precedence, so that man, by virtue of being not-woman, is henceforth excluded from harnessing the power of new technologies. The binary remains intact, the terms are simply reversed and the logic of identity still functions to the detriment of autonomous difference. Thus, there can be no reconfiguration of woman through a revaluation of the daily activities of women as mobile, fluid and unstable, relocating those values and women with them to the other side of binary oppositions. To the extent that it leaves intact that binary structure premised on woman's elaboration as not-man, such a rearrangement cannot indicate a generalised epistemological shift.

Plant is clearly attempting to think the relationship between women and technologies on a more complex level than the instrumental, as well as to survey multiple moments of intersection, to discern the extent to which technologies facilitate epistemic change and how women might benefit from such change. She contends that information itself is a new mode of knowledge, a knowledge evacuated of content and relation to materiality. Moreover, she argues that information technologies such as the internet and neural nets, in so far as they function to move information without any relation to physicality or

locality, epitomise the new post-modern episteme. However, in equating these specific technologies with women, I would argue she short-circuits the argument that they are of another, information-based, epistemological and social order. To the extent that she wants to claim these technologies for women, she ultimately reiterates an instrumental model of technology similar to equality feminism, in which the wresting of technologies from man, though the bonds of kinship, delivers to women not only men's social and industrial power, but also their very claim to subjectivity, to man. The difficulty with this move is that, to the extent that man as subject is articulated through a framework of knowledge and power, which likewise articulates technology, any claim that use, ownership or affinity with specific technologies offers a means to displace man presumes that such technologies already exist outside this framework and can therefore be mobilised against it. This is not to say that there might not be, in the development and modes of operation of these technologies, the beginnings of a shift or a chink in modern modes of knowledge. As Foucault has shown, it is sometimes the cumulative effects of intellectual, scientific and philosophical endeavour that precipitate such shifts. However, in her account of how new technologies have dispatched man and retrenched the human, to the extent that she merely substitutes woman as subject (albeit a mobile and diffuse one), and man in his rigidity as the other/object against which she is defined, Plant is unable to move beyond the binary subject/object logic of modernity.

Where Plant is attempting to link women, woman and technologies in a coalition that challenges man, Haraway pursues the possibility of technological transformation along another avenue. She is not explicitly concerned with how scientific discourses and new technological configurations might forge an alliance between women and technology. Rather, she is interested in exploring the possibilities of dismantling the entire edifice of

Western subjectivity and the associated genders, sexual identities and categories such as woman and man.

Haraway – Post-human Cyborgs

Haraway's *Manifesto for Cyborgs* has become a landmark feminist text on the issues of subjectivity, technology and power. Here she explores the challenges posed by technologies in the late twentieth century to the epistemological framework of binary opposition which supports the 'Western' model of masculine. Information and communication technologies, as a series of artifacts and practices, are symptomatic of an emergent mode of knowledge, she claims, which will radically reconfigure the subject. In this reconfiguration, sexual difference will be reformulated along lines other than those of exclusion and erasure, through which man occupies the position of subjective 'I':

> As far as we know ourselves... we find ourselves to be cyborgs, hybrids, mosaics, chimeras. Biological organisms have become biotic systems, communication devices like others. There is no fundamental, ontological separation in our knowledge of the machine and organism, or technical and organic. (1991:177/8)

Central to Haraway's reconfiguration of the subject is the figure of the cyborg, which displaces the human. Haraway declares that the epistemological categories that fixed humans as human no longer hold because they have been eroded by technologies, new scientific discourses and the philosophic discourses of post-modernism. With the dissolution of the human as a category, the edifice of western subjectivity, in which man is the privileged marker of the human, unravels. Following Irigaray, Haraway identifies man's claim on both subjectivity and the human as established and maintained through

the exclusionary logic of identity. The western subject is elaborated through a whole raft of binary oppositions, including man/woman, human/animal, organic/inorganic, human/ machine, culture/nature, self/other, mind/body, all of which function to support the apparent self-evidence and self-identity of the subject. She considers that any attempt to transform the subordinate term, through simply laying claim to a unitary identity of its own, is futile as it fails to escape the oppressive logic of the binary structure. Rather, through the figure of the cyborg, she attempts to chart a course for transformation by laying siege to binarism itself.

Haraway identifies two main sources of disruption of the binaries: information and communications technologies; and scientific discourses such as cybernetics and the 'new' biology. Both problematise nature/culture and associated oppositions and, in doing so, stress the category of human elaborated through such binaries. Technological objects participate in this shift in so far as, in their increasingly intimate contact with humans, they give rise to the cyborg: "a cybernetic organism, a hybrid of machine and organism..."(149), that blurs the boundaries between natural and artificial. However, it is at the site of discourse that Haraway principally sees a major shift occurring. She argues that the emergence of communication science and new discourses of biology have radically refigured the status of both humans and technologies and so given rise to a new epistemology within which structures such as the nature/culture opposition no longer function:

> Communications sciences and biology are constructions of natural-technical objects of knowledge in which the difference between machine and organism is thoroughly blurred; mind, body, and tool are on very intimate terms. (165)

This blurring occurs through an epistemological shift to "*the translation of the world into a problem of coding*" (104). Within the discourses of contemporary biological sciences, such as molecular genetics, ecology, sociobiological evolutionary theory, as well as cybernetics and information sciences, all objects and organisms are understood and analysed as coded devices. Animate and inanimate objects alike are framed as communications systems or networks, to be known through a process of decoding and restructured by altering the patterns of coding. For Haraway, this shift dislodges the human, introducing a founding level of commonality that precludes any recourse to transcendent identity, essential 'nature' or self-sufficient categories such as human, machine, nature, culture:

> No objects, spaces, or bodies are sacred in themselves; any component can be interfaced with any other if the proper standard, the proper code, can be constructed for processing signals in a common language. (164)

In the face of this coded commensurability, the demarcation of boundaries between categories such as animal/human, human/machine is no longer possible. The figure which emerges from this categorical breakdown is that of the cyborg: "text, machine, body and metaphor" (211).

Tracing the implications of this shift which renders all entities as variable patterns of code, Haraway sees that it is equally open to reiterating the relations of power and domination of western capitalism and western identity, as well as to opening some possibilities of challenge to such regimes, through the figure of the cyborg. She gives the name the 'informatics of domination' (161) to the functional set of power relations that accompany an epistemological shift to universal coding. While this coding might

disrupt the binaries, the 'informatics of domination' which it supports, maintains and even escalates the hierarchies of industrial capitalist society, on both the theoretical and material levels. In theoretical terms, she sees that the complete translatability of all entities and objects into a common code facilitates the pursuit of unity and sameness to its logical extreme. In so far as there is one overarching master code, from which all variations are composed, there is the assertion of an underlying sameness from which all differences are distinguished as combinatory variations. For Haraway, this is a representational regime which strives for:

> a common language in which all resistance to instrumental control disappears and all heterogeneity can be submitted to disassembly, reassembly, investment, and exchange. (164)

It is in response to the totality of this regime of representation that Haraway wants to position her cyborg as the possibility of other modes of identity. For her, the dissolution of the category of human, effected by the emergence of the informatics of domination, is to be celebrated as it undermines the stability and centrality of the Western subject – man – and gives rise to a fractured cyborg identity. The cyborg is a feminist figure to the extent that it is not articulated through the binary structures that situate woman as not-man. Further, it is a post-human figure and as such not only refuses man as the marker of the human, but refuses any understanding of the human arrived at through the exclusionary logic of identity. Haraway sees that the cyborg is not directed toward establishing a unitary identity, but is rather in flux and mobile, and as such offers an exemplary site for the articulation of genuine sexual difference. Thus, while the translation of the world into coding might escalate the representational order of the

same, Haraway claims that feminists, by embracing the breakdown of binary logic which it enacts, might find a basis on which to challenge this regime:

> That is why cyborg politics insist on noise and advocate pollution, rejoining in the illegitimate fusions of animal and machine. There are the couplings which make man and woman so problematic, subverting the structure of desire, the force imagined to generate language and gender, and so subverting the structure and modes of reproduction of 'Western' identity, of nature and culture, of mirror and eye, slave and master, body and mind. (176)

For Haraway invoking and coding the cyborg has become a political imperative for feminism. One of the first acts of the cyborg is to reject the monolithic category of woman, as it is articulated through the logic of identity which elaborates man and functions in line with that logic to erase the differences between women. Thus Haraway insists that the refusal of man necessitates the refusal of woman. For Haraway sexual difference becomes one of any number of multiple, contradictory and partial positions that a cyborg identity might occupy. She sees the mobility of the cyborg in terms of sexual identity, as derived from its exemption from the discursive frameworks and practices that elaborate social subjectivity. Key amongst these is the discourse of psychoanalysis and its account of the processes through which embodied sexual difference becomes inscribed with social sexual identities at the expense of woman.

Sex and the Cyborg

Haraway moves to circumvent the problems of embodied social subjectivity by situating the figure of the cyborg outside the psychoanalytic model of the acquisition of subjectivity. Within that model, the Oedipus complex marks the transition point where the pre-oedipal proto-subject assumes a prescribed social identity and so acquires 'subject' status. This transition is tied to the representation of bodies, for in order to

acquire social subjectivity certain understandings of bodies must be accepted. The body of the mother and thus of all women must be understood as castrated, as lacking. As Irigaray has pointed out, in such a representational economy female bodies become subordinated and figured only in terms defined by the male, that is, as possessing or lacking a penis, or possessing a sex organ which accommodates the penis. Any autonomous positive representation of female anatomy is refused. If this understanding of bodies is required in order to traverse the Oedipus complex and acquire social subjectivity, then that subjectivity is clearly inseparable from the conceptual framing and experience of embodiment. Haraway would exempt her cyborg from this matrix of embodied sexual identity by claiming that cyborgs arise from a process of replication/production rather than reproduction. As such, they do not experience any symbiotic wholeness in relation to the (m)other and thus do not participate in this process of social regulation of that relation that occurs in the Oedipus complex. Thus, the cyborg avoids the matrix of social and cultural representation and regulation which give rise to the social subject. This includes exemption from socially delimited sexual identities and thus, for Haraway, the cyborg is a figure available for inscription in multiple and autonomous ways.

Having evaded embodied sexed subjectivity, Haraway argues that the cyborg is also exempt from the desire to return to a state of pre-Oedipal plenitude or wholeness. The cyborg is released from any compulsion toward achieving the unified stable identity that propels the economy of identity. This yearning for pre-Oedipal symbiosis, she argues, underwrites the structure of western desire and language as expressed through the representational system of binarism. Thus, in positioning the cyborg outside the processes of social subjectivity described in the discourse of psychoanalysis, Haraway

disengages it from sexual identity as configured through those processes. This she sees as the key to the emancipatory potential of the cyborg for women:

> The Cyborg is a creature in a post gender world; it has no truck with bisexuality, pre-Oedipal symbiosis, unalienated labor, or other seductions to organic wholeness through a final appropriation of all the powers of the parts into a higher unity. (150)

Haraway is clearly attuned to the need to displace, not only the figure of man, but the logic that articulates him. Her response is twofold: displacing discursive frameworks such as psychoanalysis through which man is articulated; but also undermining the binary structure, and its logic of identity, through the assertion of an ontological sameness of coding as the new mode of knowledge. The figure of the cyborg is enabled by this shift in knowledge and, to the extent that it can then be used to counter man, marks it, for Haraway, as liberatory. I would claim that we can assess the effectiveness of Haraway's cyborg, in escaping binary categories and thus marking a wholesale shift from the logic of identity, by considering how difference itself is rendered. One avenue for making such an assessment is to examine how bodies are understood and apprehended in Haraway's formulation of the cyborg. Given that Irigaray has demonstrated how bodies are sites of irreducible difference, then an examination of how bodily difference is accounted for within particular theoretical models will offer us an indication of how those models apprehend and conceptualise difference.

For Haraway's cyborg to short circuit the Oedipal loop, the organic bodies that give rise to and support gendered social subjectivities must be disrupted and ultimately dissolved. The cyborg, as a figure generated through the physical intersection of technologies and bodies, effects just such a disruption. In the process of meshing with technologies, in

the seamless interfaces enabled by shared informational ontology, organic bodies are obliterated. In contrast to any feminist project that might ground resistance on such an organic body, eco-feminism for example, Haraway locates the cyborg's revolutionary capacity in its very dissolution. The cyborg rejects "the analytical resources developed by progressives [which] have insisted on the necessary domination of technics and recalled us to an imagined organic body to integrate our resistance" (154). Haraway's refusal of the organic natural body is aimed at removing the basis on which gendered social identity is articulated. She insists that there can be no such natural body, but rather that bodies are code-bearing and denaturalised through the discourses of biology and their osmosis with machines. While Haraway is attempting to break down the categorical frameworks through which woman, as a monolithic category, is understood only in her difference *from* man, in order to allow women other sexual identities, I would claim that she falls short of elaborating the radical epistemological shift required in order to account for autonomous sexual difference, or difference in general other than in a relation of sameness. By tracing the excision of sexually differentiated bodies in the configuration of the cyborg, it is apparent that Haraway's revolutionary project remains contained within the conceptual framework of identity.

By removing the cyborg from the Oedipal matrix, Haraway hopes to short-circuit, not only the entire Western model of subjectivity, but the sexual identities central to it. While the cyborg might well achieve this, it does so by refusing the sexed specificity of bodies and therefore any account, such as psychoanalysis, of the intersection of bodies with the forces of knowledge and power in the formulation of social subjectivity. Bodies, for Haraway, become code bearing entities in the epistemological shift of the late twentieth century and, as such, they interface and intermingle with other code-

bearing entities, in such a way that difference becomes a matter of combinations of coding. Coding those bodies along the lines of man and woman is purely arbitrary and, for Haraway, must be dispensed with in order to allow more multiple and self-defining coded identities to emerge. However, I would argue that, in disembodying sexual difference into code in order to articulate sexual difference as fragmentary and mobile, in contrast to the fixed categories of woman, and man, she performs the same erasure Irigaray finds in psychoanalysis and metaphysics. The specificity of bodies, their difference, is erased in a conceptual economy which, as Haraway herself has acknowledged, escalates the logic of self-identity. If information becomes the ground of knowledge, then sexually-differentiated bodies are understood as simply variable combinations of information. This is clearly a reiteration of the logic of identity, in which identity is attributed by accounting for each object in terms of its difference *from* a central determinant, in this case pure information. In Haraway's information age, man is more obviously also structured in these terms than when he occupies the privileged subject position of western subjectivity. Deposing man from this position, but installing instead the pure idea or theoretical figure of information, might give rise to some realignment of the relation between man and woman just as Haraway claims, but it does not dissolve the epistemological structure whereby difference is accounted for through sameness. Moreover, as Irigaray has shown, the movement of dematerialization necessary to establish a self-referential basis of knowledge, either as thought or information, is premised on a differential relation between the sexes. It entails a denial not only of the material aspects of thought, but also the maternal origins of that matter. In Haraway's information paradigm, thought becomes an information process and, thus, as she herself notes, to the extent that information is taken as immaterial and non-human it can all the more effectively deny any such connection (64).

I would claim that Haraway's cyborg is thus unable to escape the logic of identity. This is apparent in the erasure of embodied difference, but equally so in the model of the machine-body meld of the cyborg. In the figure of the cyborg she wants to blur the boundary between mind and body, organic bodies and inorganic machines. This occurs both through the shared coding of each as information and through the melding of technological devices and bodies. However, such melding offers a prosthetic account of technologies, in which they are additions to the organic body. To proceed on the basis of a prosthetic model of technological addition is to reinstate the binary Haraway labours to displace. In so far as the hybrid cyborg is forged in the intermeshing of technology with the body, through a process of addition, it leaves intact the two categories that preceded the conjunction. However intermingled, the ingredients of the cyborg – bodies and technologies – can be discerned and the cyborg dismembered into a pre-cyborg organic body and a pre-cyborg technology. As Vicki Kirby points out:

> Haraway's "disassembled and reassembled" recipe for cyborg graftings is utterly dependent on the calculus of one plus one, the logic wherein pre-existent identities are *then* conjoined and melded. The cyborg's chimerical complications are therefore never so promiscuous that its parts cannot be separated even if only retrospectively. (1997:147)

This original demarcation of the components of the hybrid functionally reinstates the human as a stable site that cannot be retrospectively conjured away by a subsequent seamless interface of shared coding. In proposing the cyborg as hybrid, Haraway reiterates precisely the categorical demarcation of human and machine she is attempting to dissolve.

Feminism and the Post-human

Haraway canvasses the role of technology in effecting change in the status of woman through an examination of how technological objects and scientific discourses deconstruct the categories that support a particular configuration of the human. For her, the human is a privileged position that man occupies in human/technology relations. In dislodging man along with the human, Haraway hopes to clear a space where women might be able to articulate autonomous specific identities not bound by the rigid structures of unified self-identity that mark man. For Plant, too, technology presents a powerful challenge to man's self-identity. However, unlike Haraway she does not see women as emerging autonomously after this challenge has debilitated man. Rather, they have always also presented a challenge to man and it is the conjunction of woman, women and technology that will displace man. For both, then, the concept of post-human is that of post-man, where man has been overturned as the central ordering principle in an economy of identity. For both, technology plays a crucial role in precipitating this transition; for both, sexual difference is one of the key issues at stake. It is in the pursuit of difference rather than identity, or sameness, that both Haraway and Plant look to the disruptive effects of technologies. If the emergence of the post-human works not simply to shift man from the centre, but to dismantle the epistemological structure that sets him there and orders the entire field of knowledge around him, then it will indeed promise radical transformation. It is through such a transformation that the epistemological space might appear within which woman might be articulated other than in a relation to man, and other than a monolithic category itself.

Both Plant and Haraway fall short of articulating such a shift. Plant continues to seek the ground of woman's specificity in the differences *between* men and women –

morphological, communicative, everyday practices and professions – these differences are still conceptualised in terms of differences *from*, and thus bound by the logic of identity. For Plant, women are the *same as* technology and both are *different from* men. Haraway avoids this pitfall, but in dispensing with materially sexed bodies, in a move intended to deprive the human of its organic unity, she enacts an even more complete erasure of difference. Moreover, she relies on an originary unity as the condition of possibility for the subsequent mutations that form her hybrid creations. Thus, the logic of identity is problematised, but always remains implicit as the starting point for subsequent concoctions of techno-flesh.

Importantly, Plant and Haraway in both their insights and shortcomings indicate the task ahead. Their success is that they move beyond instrumental understandings as the basis for assessing the intersection of women and technology and on to the terrain signalled by Irigaray. They focus the question of transformation on the necessity of dislodging the figure of man as subjective 'I', as elaborated through an exclusionary logic of identity. They are interested in how technology, as object and discourse, both participates in and challenges this logic. Their failures, which are equally instructive, indicate that what is required is an epistemological shift so that difference can be conceptualised as irreducible differences *in kind*, rather than only in terms of differences *in degree*, in a logic of identity. For Plant this means having to think women's differences autonomously from men, and for Haraway it means accounting for embodied sexual difference as a difference in kind. If Plant and Haraway fall short of articulating the conceptual transformation required, then I want to turn now to another animated site of feminist discourse, which is very much concerned with the possibilities technologies offer for transformation. In the next chapter I want to explore feminism's encounter

with the discourses of cyberspace and examine how and with what success they have taken up the challenges posed by Irigaray, Plant and Haraway.

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[1] In Plant, and other accounts of information and communication technologies, we find a degree of slippage here between these two terms which produces two (at least) inflections of post-modern. The first takes up the 'industrial' and is marked as post-modern in the sense of modernity as an historical period characterized by an industrial, manufacturing economic base. In the other sense post-modern is understood as subsequent to the modern modes of knowledge and epistemological structures. While both senses are linked, for example in Foucault's accounts of the way modern modes of knowledge form the underpinnings of the industrial revolution and economic organization, it is more often, and specifically in the case of Plant, that the post-industrial inflection of the term is more strongly invoked, though I would claim, always with the often unacknowledged resonance of the second understanding.

Chapter 4

Cyberspace and Transformation

If modernity or the mode of production signifies modern practices that elicit identities as autonomous and (instrumentally) rational, post-modernity or the mode of information indicates communication practices that constitute subjects as unstable, multiple and diffuse.

Mark Poster. *Postmodern Virtualities*

The notion that new information and communication technologies will be the driving force of a millennial shift, which will radically refigure what it is to be human, is a consistent motif in the discourses of cyberspace. Across the narratives of cyberspace, it is widely assumed that new technologies and associated scientific discourses present challenges to the entrenched order of modernity on a range of fronts, from the industrial to the representational, and will usher in a post-modern epoch. Sadie Plant argues that the changing nature of industry and the workplace, from heavy industry to information processing, marks a significant shift in economic and social orders through the feminisation of the workforce (1998:38/39). Mark Poster describes epochal change, occurring on the representational front, as the arrival of the 'second media age', in which a shift in the framework of representation brings with it a shift in the very nature of objects of representation. Information technologies, in Poster's account, signal the triumph of representation over presence whereby the unity and stability of identity previously sustained by a stable referent dissolves (1995:85). N. Katherine Hayles also argues that the predominance of information has led to the widely held view that there is a fundamental shift in representational frameworks, whereby presence/absence are eclipsed by pattern/randomness as the mode of representation in an information age (1999:25). In the realm of everyday social and communicative interaction, Alquerque Roseanne Stone observes that the emergence of 'virtual systems' of community and culture, enabled by information technologies, mark the "close of the mechanical age" (1992:609). While on an ontological level, Donna Haraway claims that an epochal shift is under way, instigated by the arrival of a common ontology of information, understood to render untenable all previous demarcations of discrete, bounded and unique categories, including those of object or subject (1991:177/8).

While such analyses focus on different sites of transformation, they share a general consensus that the existing representational framework of modernity gave way, in the late twentieth century, to a post-modern milieu, shaped by the properties, flows and technologies of information. Information infiltrates and breaks down the boundaries of the stable categories and conceptual frameworks of modernity, particularly that of the human, and thus clears the way for new modes of subjectivity and community. Cyberspace emerged in the late 1980s as an active site of investigation of the impact of new networks of information and communication technologies.[1] Across a wide range of disciplines scholars and other commentators have investigated, with equal measures of enthusiasm and suspicion, the impact of the emergence of these technological configurations on society, subjectivity, politics, commerce and aesthetics. Feminists have been prominent among those eager to both assess the possibilities offered by these new technologies and to investigate their connections with existing patterns of technological deployment and power relations. In the previous chapter, I examined two prominent feminist scholars of new information technologies, Haraway and Plant, in order to identify some of the possibilities and pitfalls of theorising information technology-led transformation. In this chapter, I want to focus more specifically on the discourses of transformation that circulate around cyberspace as a set of technologies and social practices. I will assess the transformational claims that propel these discourses, including those that hail cyberspace as ushering in an era of subjective liberation, as well as more sceptical accounts which while wary of the outcomes, nonetheless accept that new information and communications technologies are accompanied by an inevitable movement of change.

In the previous chapter, I argued that transformation must attend to questions of knowledge and conceptual frameworks, as well as to everyday engagements with technologies, and that failure to do so curtails transformative possibilities. Following Irigaray, it became clear that the binary logic which characterises the conceptual structure of identity, is one such framework that feminism must challenge and displace in order to transform the status of woman. In this chapter, I want to bring this insight to the discourses and frameworks through which feminists and others have theorized and understood cyberspace, in order to assess the extent to which the transformational expectations of a post-modern epoch are justified. As such, this chapter is not an exercise in explaining cyberspace *per se*, but rather concerns the conceptual frameworks that underpin the dominant understandings of the set of technologies and practices that comprise 'cyberspace' and their implications for feminist transformational agendas.

Discourses of cyberspace move seamlessly across fiction, scientific inquiry, philosophy and the other 'human' sciences. Approaches to theorising cyberspace regularly undertake readings of 'fictional' texts to discern the basis of imagined futures and contemporary collective fantasies. This is unsurprising given that the trope of technology precipitating new social spaces and cultural orders is a staple of science fiction and that much of the imagery and terminology of cyberspace originated in science-fiction novels in the early eighties.[2] That the guiding metaphors, particularly that of 'cyberspace' itself, were brought into currency and given their particular inflections through science fiction and, to a lesser degree, popular science texts, contributes greatly to the speculative nature of much analysis, as well as to the pre-eminence of discourses of transformation, evolution and epochal change. Indeed, according to Stone, we are investigating a domain that does not yet exist (1992:609).

Other lines of investigation adopt more formal ethnographic and sociological methodologies to chart social organisation and interaction on the internet. (Escobar 1994, Baym 1995, Reid 1995, Shields 1996b, Jones 1998) Still others are taken up with questions of ontology and metaphysics. (Porush 1994, Heim 1991, Strate 1999) While there are clearly differences in the technological configurations, modes of participation and social organisation elaborated across the range of theoretical and fictional accounts of cyberspace, I would claim that there are also discernible points of convergence. It is on these predominant shared understandings, which arose in the first wave of investigation of cyberspace and which have since achieved almost common-sense status, that this chapter will focus. In particular, I want to examine the dominant formulations of bodies that emerge across the spectrum of studies of technology, fiction, theory and thought experiments, that look to technological futures for the possibility of transformation.

Bodies function as a guiding thread in this analysis, in so far as they bring into focus the principal questions of this project. They open directly onto a consideration of technology, most obviously where bodies are a site of interface with the information technologies of cyberspace. In mapping the meetings of bodies with these 'new' technologies, I want to explore, in the first instance, how this meeting is understood to give rise to particular transformed subjectivities; and secondly, what understandings of technology, bodies, and their mode of interaction, such transformative scenarios turn upon. In the previous chapter, I claimed that bodies were a site of irreducible difference, actively erased by the logic of identity. In tracking how different bodies are imagined, apprehended and articulated in scenarios of cyberspace transformation, the broader conceptual frameworks which inform them will become apparent, so that it should be

possible to evaluate whether those formulations do indeed offer an alternative to the logic of identity. I hope thus to assess whether the claims for transformation based on the appearance of cyberspace do indeed uncover a new field of possibilities for feminists concerned with elaborating sexual difference.

Bodies of Information

According to Hayles, one of the founding assumptions of discourses of information is that information is radically separate from matter. She argues that this separation occurs as a result of the historic formulation of the concept of information, rather than reflecting some undeniable truth (2000:69). I would argue that this distinction between information and matter underpins the dominant formulations of bodies and their interactions with technologies, across the varied discourses of cyberspace. Moreover I would claim that this information/matter dichotomy is most often cashed out as a mind/body opposition and these two formulations dominate the conceptual horizon within which bodies are most widely configured in analyses of cyberspace. This is particularly evident in the two prominent and widespread tropes of embodiment that form the basis for much of the perceived transformational potential of cyberspace: disembodied consciousness and virtual bodies.

Informed by a dual lineage drawn from cybernetics and science fiction, the notion of free floating consciousness released from a redundant physical body is one of the earliest and most pervasive tropes in the discourses of cyberspace. (Gibson 1984, Heim 1991, Stone 1991, Rheingold 1993, Turkle 1995, Cherney 1996, Wiley 1999) As Hayles points out, the possibility of such radical separation of consciousness and body depends on foregrounding information as the determinate medium of a cyberspace

generated by information-processing technologies (2000:93). Cybernetic researcher, Hans Moravec, most vividly elaborates the outcome of the intersection of information and information technologies with bodies. The most exemplary advocate of radical disembodiment, Moravec envisioned a post-biological age, where the increasing power and sophistication of computer technologies eventually facilitate the downloading of consciousness into computer memory, which would survive the mortal physical body. For Moravec, the subject is located and constituted within the pattern of information in the brain and, as such, the body is only ever a mechanical conveyance and often an inconvenience. Consciousness, as brain pattern, is understood to be of the order of cybernetic feedback loops and information processing systems and, on this basis, is completely compatible with other information patterns and processing devices such as computers. According to Moravec's 'transmigration' scenario, a downloaded data-based consciousness could be temporarily relocated or transferred into a variety of robotic vehicles pragmatically selected to accomplish any number of tasks.

Moravec's thought experiment may propose a fanciful imagined future, but nevertheless, in his insistence on the precedence of information as the decisive factor governing the relations between embodied individuals and technologies, he gestures towards a conceptual horizon where information processing is the principle function and defining mode of existence for the subject, to the detriment of embodied existence:

> Body-identity assumes that a person is defined by the stuff of which a human body is made... Pattern-identity, conversely, defines the essence of a person, say myself, as the pattern and the process going on in my head and body, not the machinery supporting that process. If the process is preserved, I am preserved. The rest is mere jelly. (1988:116)

The human organism becomes a particular distribution of information that can be exchanged, intermeshed, and mingled with other information processing systems.

In Moravec's scenario, the inferior materiality of the body, with its mortality and vulnerability to disease and environmental threats, is rendered obsolete through radical disembodiment. This is not to say, however, that the body is simply excluded as being wholly composed of inert matter, as distinct from an information-based mind. The language and conceptual paradigm of cybernetics equally penetrate the body. Consciousness is not the only site of information-processing, since the body itself is seen to be permeated by information, which serves to distinguish between the informational systems of bodies and a physical substrate. For cybernetics, the informational structure of DNA and the feedback loops of the central nervous system bespeak a body in which the flow of information constitutes its functionality. It is the ability of these bodily information functions to migrate to other sites or mechanisms of processing that renders the materiality of the physical body redundant. For Moravec, information consists of pattern and process and, as such, is radically distinct from the material. Thus, what initially appears as a mind/body dichotomy, in his transmigration scenario, turns on a more fundamental distinction between information and matter. This information/material binary serves as a founding assumption for a range of embodiment scenarios that populate the discourses of cyberspace. Moreover, the prevalence and primacy of information, as common ground or shared ontology, becomes the determining factor in analyses of the mode of interface between organic subjects and inorganic technological devices. As such, it actively sets the horizon within which the range and modalities of interaction between the bodies and technologies are articulated and gives rise to particular understandings of each.

If Moravec finds the material 'human' body utterly unnecessary and radical disembodiment an ideal solution to the limitations of the flesh, his strategy and assumptions about the nature of information are taken up, in various degrees, in a multitude of investigations into the nature of subjectivity in the cyberspaces of the internet. His formulation, drawn from the scientific discipline of cybernetics, meets with the images and tropes of science fiction in the second branch of the lineage of disembodiment. Disembodied consciousness finds some of its earliest links to information-mediated environments in the cyberpunk fiction of the 1980s. A landmark 'cyber' text, William Gibson's *Neuromancer* (1984), has been the reference point for a great deal of theorizing of cyberspace. (Tomas 1989, 1991, McCaffery 1991, Slusser & Shippey 1992, Clarke 1995, Edwards 1995, Kitchen 2000) It is not my intention to revisit Gibson in any detail here, but rather to note that his work is greatly concerned with the possibilities and consequences of various modes of bodily transformation. His protagonist Case's sense of the physical body as restrictive and imprisoning 'meat', to be gladly abandoned on entering cyberspace provides a persuasive and enduring account of cyberspace as a domain where bodies are not only redundant but also present obstacles to engagement (Foster 1993:18). Gibson's model of disembodied inhabitation of cyberspace is repeated through a raft of science fiction novels, where cyberspace is conceived as a dematerialised space of information flow and exchange, participation in which requires 'parking' the body and releasing consciousness to navigate and interact with information and other similarly free-floating consciousness.[3] Where Moravec investigates the possibilities for the transference of informational consciousness into superior technological vehicles, Gibson imagines an information space where the patterns and matrices of information entirely replace physical artifacts. This hypothetical formulation of disembodied consciousness, as the mode of entry into

information based cyberspace, has provided the basis for a range of transformational scenarios concerned with questions of identity and community in the age of the internet. (Heim 1991, Stone 1991, Thomas 1991, Miller 1995, Turkle 1995, Mitchel 1995, Curtis 1997, Donath 1999, Wertheim 1999)

As an entirely informational domain, the shared immaterial social spaces of the internet are hailed as a realm where physical attributes, such as sex, race, infirmity, and age, are to be rendered irrelevant, allowing more egalitarian 'virtual communities' to emerge. In his discussion of the communication practices of individuals interacting in the text-based bulletin boards, mailing lists, chatrooms, MUDs and MOOs of the internet, Howard Rheingold makes it clear that such disembodiment is not only the condition of a new mode of social interaction and identity, but that it also allows an escape from conventional restrictions and limitations:

> Because we cannot see one another, we are unable to form prejudices about others before we read what they have to say: Race, gender, age, national origin and physical appearance are not apparent unless a person wants to make such characteristics public. People who are thoughtful but who are not quick to formulate a reply often do better in CMC than face to face or over the telephone. People whose physical handicaps make it difficult to form new friendships find that virtual communities treat them as they always wanted to be treated - as thinkers and transmitters of ideas and feeling beings, not carnal vessels with a certain appearance and way of walking and talking (or not walking and not talking). (1993:26)

For Rheingold, disembodied interaction liberates the individual or, at least, offers a more egalitarian social environment by rendering invisible the basis on which most common prejudices of 'real life' are grounded, that is, the physical body.

While race, age, and infirmity are represented by Rheingold as physical facts, in most discourses of transformation they are commonly understood, in line with social constructivist accounts of embodiment, not simply as biological givens, but rather as categories given meaning, as a series of social and cultural values and expectations inscribed onto bodies. (Balsamo 1996, Braidotti 1998, Turkle 1995) Rather than simply mute matter, bodies within such scenarios are normally understood as irretrievably inscribed with, and marked by, social categories and codings that constrain the subjects who inhabit them. Thus, for advocates of disembodied consciousness, the positive gain in bodies' inability to cross the information threshold is the transcendence of those social inscriptions and the subsequent freedom to fashion a self-directed identity. (Rheingold 1993, Foster 1993, Edwards 1995, Bromberg 1996, Dery 1996)

If the model of disembodied consciousness finds bodies extraneous to cyber-identity, another formulation, that of the virtual body, explores the conditions under which bodies might engage with the information realm. The model of a virtual body proposes that, instead of discarding the body to access information space, the body will be transformed or (re)constructed, via technology, into an entity capable of inhabiting such spaces and providing a locus for identity. In order to become virtual, bodies are recast in terms of information. Cybernetics facilitates just such a reframing of bodies, by identifying in them the operations of various informational circuits and feedback loops that are capable of being interfaced with any other information-based system. The process of entering information space then requires some process of extraction and reformulation of this informational aspect of bodies. Presently, there are two broad schemata in circulation in which the question of virtual body arises: the electronic environments of the internet; and virtual reality technology. There is a widespread expectation of their

convergence once technological limitations are overcome, but for the present they remain distinct, in practice if not in speculation.

In one register, the virtual body is a marker for the representation of bodies in 'virtual' non-physical spaces, as distinct from the material 'real' world. In the case of the internet it is in the context of primarily text-based (though sometimes graphic) electronic environments that one model of the virtual body has currency. In the multi-user realtime interactive spaces of the internet known as MUDs or MOOs and in some chat rooms, individuals engage in a variety of activities, some of which, particularly erotic encounters, draw heavily on textual articulations and representations of bodies. The virtual body is constructed as an informatized representation of locale, physical characteristics, adornment, comportment and expression and it functions as the site for interaction with other such virtual bodies. This process is not unique to the electronic social spaces of the internet: Stone, in her discussion of telephone sex workers, describes a processes of construction and interaction of virtual, immaterial, imagined bodies through the exchange of codes and signals across the telephone lines (1992:615). Likewise, the visual avatars that are adopted by participants in more sophisticated graphical social environments present not simply a graphic icon, which is manipulated by the individual, but also the construction of a body. Creating and operating these textual and graphic virtual bodies is a process of shaping a body devised by the individual and realised through electronic construction. While hardly a material entity, this configuration of an information-based virtual body represents a configuration of the subject nonetheless distinct from that of a disembodied consciousness. In the other schema of the virtual body, generated by virtual reality technology, bodies are once again reconfigured as purely information, but they retain a more direct relation to the

material body. Virtual reality technology locates subjects and objects within a visual real-time representation of spatial surrounds. The participant occupies a virtual body that is able to move and interact with other objects in a simulated (computer-generated) environment. The virtual body, in this instance, is supposed to exist in a direct relation to the 'actual' body, as movement and perspective are generated by the 'actual' body and then experienced via visual immersion, and to a lesser degree tactile sensation, in the virtual environment. While clearly situating the physical body within the information circuit, virtual reality accounts of embodiment nonetheless still proceed on the assumption that the materiality of the actual body cannot enter the information-based space of the virtual world.

Across both formations, virtual bodies as strictly information-based serve the same transformative purpose Rheingold finds in disembodiment. In cyberspace the virtual body, as the product of an individual's independent choice and self-directed representation, removes the subject from the matrix of cultural constraints that inhere in the 'real' life body:

> Bodies in virtual space can be created with a bit of programming. "Real life" gender can be switched, skin colour can be forgotten temporarily, age or infirmity can be escaped. (Cherney 1996:1)

In passing through the process of electronic mediation, interpretation and reconstruction, the virtual body is capable of taking any form. This technological mediation offers the possibility of reshaping bodily attributes, abilities and functions as well as dislodging social codings and inscriptions. (Clarke 1995, Nguyen & Alexander 1996, Green 1997)

Spanning both these conceptions of the virtual body is a desire to maintain, even in highly modified ways, a relationship between the 'virtual' and the 'real life' physical body. The 'real life' body is that which must be translated and re-figured along the lines of the individual's will to provide a more accurate representation of their identity as conceived by themselves. As such, the virtual body does not mark an attempt to discard the material body altogether, but rather is an attempt to rearticulate the materiality of the flesh into another (immaterial) context and reshape its representations, meanings and capacities in the process. However, the virtual body remains based on an assumption of the incapacity of the material 'real life' body to access the information realm. A fundamental incompatibility between material and information is again insinuated into the encounter between the human and the technological. As with disembodiment, this impassable barrier answers the desire to escape the material body, in so far as it seemingly allows a filtering of unwanted cultural baggage in transition from 'real life' to 'virtual', from material to information. While the model of a virtual body elaborates an embodied (albeit only electronically) subjectivity, it likewise presumes that consciousness, once free from the restrictions of the materially bound and socially inscribed body, can autonomously and freely articulate its own identity.

Connected bodies

If the notions of disembodiment and the virtual body feature prominently in the discourses of cyberspace, there are sceptics, particularly among feminist thinkers, who resist the notion that consciousness can be detached entirely from the physical body. (Balsamo 1993, 1995, 1996, Hayles 1993a, Sofia 1992, Lupton 1995) This position is exemplified by two prominent feminist commentators on cyberspace, Sherry Turkle and Alquerque Roseanne Stone. While neither dismiss wholesale the notion that

disembodied identity might have possibilities as an experimental practice for resisting and temporarily displacing gendered identity, both refuse any radical redundancy of the body. Their refusal is not based, however, on any fundamental disagreement with the premise that information and information technologies, when encountering bodies, instigate some reconfiguration. Rather, they see the seemingly straightforward supposition, that the encounter between information technologies and bodies results in a neat dissection between 'real life' bodies and consciousness as information, as both simplistic and deceptive. They want to propose a more sophisticated understanding of embodiment and identity and, as feminists, see that they have a stake in retaining sexually differentiated bodies. They want to stake out a theoretical middle ground where information and matter, while remaining fundamentally distinct, are nonetheless related and implicated in complex ways. In cyberspace, these connections and relations are commonly expressed in the understanding that, while ultimately grounded in one's physical body, subjects can create new identities for themselves online that will allow them to experience/perform other subject positions. Working from a therapeutic psychological understanding of identity or 'self', Turkle exemplifies this position. She cites various case studies where participants have used self-created identities – most often of the opposite sex – in electronic environments to 'work through' psychological issues:

> As MUD players talked to me about their experiences with gender swapping, they certainly gave me reason to believe that through this practice they were working through personal issues that had to do with accepting the feminine and/or masculine in their own personalities. (Turkle 1994:362)

While Turkle clearly accepts cyberspace as a domain of disembodied interaction, since she proposes it as therapeutic tool, she assumes that the activities of a disembodied

identity have a direct causal impact on the embodied subject on the other side of the screen. Thus, while there is a distinction between the online disembodied consciousness and the embodied subject, for Turkle information permeates the material and has the capacity to affect it, in so far as the actions of a disembodied consciousness in cyberspace can have some effect on an embodied subject in the real world.

Stone offers a less directly causal account of the relationship between a disembodied entity in cyberspace and the embodied computer user. For her, this relationship is continually mediated by the cultural formations and structures of power that envelop both technology and subjectivity:

> No matter how virtual the subject may become, there is always a body attached. It may be off somewhere else ...but consciousness remains firmly rooted in the physical. Historically, body, technology and community constitute each other. (1991:111)

While both Turkle and Stone insist on the presence of the body in 'real' space and on it having some form of connection to any disembodied cyber-identity, they still gravitate toward the possibility of disembodied consciousness as transformative. In so far as they suggest the possibility of a post-gender identity constituted and instantiated in the electronic networks of the internet, they mark the material body as a site of social repression and restriction, from which even a limited and temporary escape opens up possibilities for transformation. While refusing the possibility of a complete severence of mind and body, to the extent that both entertain the possibility of consciousness escaping the social meanings and constraints inscribed on the body, and reinventing identity, at least within cyberspace, along self-directed lines, they share the same

conceptual ground as more radical proponents of disembodiment or virtual re-embodiment.

Both disembodiment and virtual embodiment rest on the possibility of radical separation between mind and body, a separation facilitated by the discourse of information and the operations of information technologies. Within this mind/body schema bodies are not, in all cases, viewed as wholly natural, composed entirely of brute materiality. Rather, they are socially constructed: the social understandings which give meaning to bodies, and the institutional regulatory practices enacted on bodies, combine to constitute limited subject positions through which the individual understands his or her body. Individuals, on this understanding, must assume these delimited subjectivities, at the expense of individuated difference, in order to be intelligible and functional with the social realm. While such an understanding of bodies presumes an intimate relation between bodies and consciousness, there remains in models of cyberspace transformation an assumption that, at some point, a clear separation can be made between the two. In cyberspace, consciousness is able to define itself outside bodily limitations, be they physical, social or a mesh of the two. Thus, however complex and interrelated embodiment and consciousness may be, transformative scenarios of cyberspace, to the extent they proceed on the basis of a liberated consciousness refiguring identity, rely on a clear-cut mind/body binary opposition. This mind/body opposition functions in tandem with an information/matter opposition and together, I would claim, they comprise the conceptual horizon within which accounts of electronic disembodiment and self-constructed virtual bodies are elaborated. Moreover, I would suggest that in feminist accounts of the transformative possibilities of cyberspace this

conceptual horizon lends itself to the predominance of a particular formulation of embodied subjectivity - that of gender/sex.

Degendering Bodies: information/matter - gender/sex

For some feminists, cyberspace offers an avenue for the creation of identity unconstrained by conventional representations of sexual difference. The movement of disembodiment, or virtualisation, would seem to relegate sexual difference to the material realm ostracised from cyberspace, with the physically sexed body, and thus leave individuals free to construct their own sexual identity:

> By providing women with an opportunity to express their ideas in a way that transcends the biological body, this technology gives them the power to redefine themselves outside of the historical categories of "women", "other", or "object". (Shade 1994:5)

Women can escape their 'woman' category, understood as a wholly social inscription borne on the body, and are thus able to evade oppressive power structures and create their own identities. In this instance, bodies are again not simply the redundant (sexed) physical matter, but also surfaces of inscription and social coding. The social inscriptions affixed to the materially sexed body are most commonly expressed through the term gender. I want to explore this formulation of gender, as social inscription appended to a materially sexed body, in order to discern how it has come to be such a central tenet in feminist theorising of cyberspace and, as such, to what extent it opens up or blocks transformation. Gender has become a contested concept in recent feminist theorizing, but rather than explore the intricacies of those ongoing debates, I want to focus on the basic formulation of the gender/sex configuration and to explore the understandings of bodies elaborated through it.

In chapter one I examined how, in constructivist attempts to think technology, the concept of gender functioned to explain the socially constructed categories of masculinity and femininity. I critiqued those accounts principally in terms of how they articulated a particular model of technology, which could not adequately explain the complexities of subjectivity or give a convincing account of the conceptual configurations that set man and technology in a particular relation. At this point, I want to turn to the gender half of that relation and explore what account of bodies it gives. Gender is a key concept in constructivist accounts of sexual identity: it allows feminists to examine the relative positions of men and women, in terms of the historical constitution of sexual identity through social formations, discourses and practices, without recourse to essentialism. If sexual identity is considered to be constituted and maintained by these processes, there can be no suggestion that masculinity or femininity arise from essential, immutable, biological characteristics and, as such, radical transformation is possible.

While gender is a mobile concept in feminist thought, taking different inflections according to context, its theoretical antecedents trace back to equality feminism, where it was distinguished from, and articulated in relation to, sex. While the basic formulation of gender has undergone considerable elaboration and complication in feminist theory, the founding demarcation of sex/gender remains active.[4] As we saw in chapter one, in constructivist accounts of technology gender remains a prominent and valued concept. Moreover, given the commitment of constructivist feminism to investigating the social processes of construction and maintenance of sexual identity, and the desire to avoid essentialist positions regarding femininity and masculinity, it is unsurprising that attention is directed to the processes that constitute gender, whilst the

question of sex is largely deferred. It is in terms of gender that society is understood as determining roles and status, delimiting spheres of activity, articulating the differences between the masculine and the feminine. Gendered subject positions are perceived as the means through which individuals attain social identity and these positions are seen to be instituted by a range of pervasive and diverse institutional practices, discourses and formations (Grosz 1994:17). In engaging with these, physically sexed persons assume the gendered identity deemed appropriate to them and this appropriateness is determined on the basis of the sex of their body. In this manner, male bodies are deemed the site of a masculine gendered identity and female bodies the site of a feminine gendered identity. In order to avoid essentialising femininity and masculinity as the inherent traits and characteristics of women and men, it is insisted that this assignment of gender to sexed body is entirely arbitrary and discursively constructed (16/17). Any apparent 'naturalness' or 'normality' in this association occurs by virtue of the power and pervasiveness of social discourses, practices and institutions. Phenomena such as transexualism, wherein the conventional alignment of gender identity and sexed body does not occur, are offered as evidence of this arbitrary connection between sexed bodies and social genders. In this basic model of sex/gender, bodies are the sexed material that indicate which gendered identity is appropriate.

In more sophisticated constructivist accounts of embodiment, such as that offered by Butler (1993), this assignation is not a simple one-way process, but rather functions as a feedback loop. The socially constructed sexual identity determines how bodies are managed and comported, experienced and understood. At the same time this social coding and management of bodies functions further to insinuate gender on an individual level. A feminine gendered identity is inscribed upon a sexed female body, but it is

through the gendered identity that the 'femaleness' of that body is understood. Bodily practice and discourses of the body articulate the body as sexed and shape subjective understanding and experience of it in particular ways, which themselves reiterate a feminine gendered identity. Bodies, in the first instance, are the basis for the allocation of a specific gendered identity but are themselves equally articulated and experienced through their coding as gendered. Bray and Colebrook describe how this reorients the relation between sex and gender:

> Refining the sex/gender distinction, these discursive accounts argue that the body of nature or biology is thoroughly located within discourse and that the appeal to a prediscursive "sex" is enabled only by discourse. Accordingly, the attempt is made to "free" gender from sex – to see gender not as a cultural overlay but as that which produces "sex" as a discursive given. (1998:42)

They go on to argue, however, that Butler's shifting of 'sex' into the discursive realm posits a pre-discursive body, albeit one that can only be apprehended through discourse (42). As such, there remains a distinction between the corporeality of sexed bodies outside discourse, as distinct from the discursive construction of sex, which is somehow appended to those 'outside' bodies via the performance of gender. Thus, for Colebrook, in the distinction between sex and gender, bodies are inevitably articulated through a representation/matter division (2000:78).

Moira Gatens shows how the elaboration of the relation between sex and gender as arbitrary installs a binary logic into formulations of gendered identity. Within the sex/gender distinction she finds an assumption of some residual neutral body, which exists prior to and outside of the social gendered coding, a natural body (1996:8).[5] This 'natural' body is that which is apprehended and then managed by the discourses and mechanisms of the social inscription of gender. As such, the 'natural body' remains to a

degree extra-social. That is, to the extent that gender is considered a socially constructed set of discourses and practices assigned to materially sexed bodies, the possibility exists that it might be detached, leaving an ungendered body. This is for constructivist feminists the key to avoiding essentialism. The bodies that remain outside gender remain sexed, but this sexing is exempt from any social significance within the province of gender construction and in that way quarantines identity from essential attributes embedded in a specific sexed body. Models of the social construction of bodies equally institute this extra-social body. The social body is that which is understood and experienced through social discourse and practices and inhabited as such in the process of acquiring social subjectivity. This process is described as one of circumscription and coding, which functions to delimit the social body from some pre-social body that both exceeds and precedes the social. As such, it relies on the same conception of a somehow 'natural' sexed body distinct from the socially constructed gendered one, rather than an equally sexed body and identity.

That the body is apprehended, ordered and given meaning through the discourses, institutions and everyday practices of the social is not disputed. However the difficulty with the constructivist model is its positing of the pre-social body as 'natural'. As Grosz points out, such a model is founded on the operation of binary oppositions (1994:16/17). Clearly, an opposition between nature and culture is in play in the positing of a 'social' as opposed to a 'natural' body. But that opposition turns on a more basic mind/body opposition, which constructivist accounts of embodiment cannot entirely displace. The natural body is the brute sexed materiality, the social body the gendered representations and understandings of that body, which are installed and function in the realm of consciousness. In this manner, nature/culture, sex/gender and body/mind form the basis

of the constructivist account of sexual identity and subjectivity as gendered. These dichotomies are clearly active in feminist accounts of cyberspace, particularly those that explore the possibility of dislodging gender via engaging with the technologies of cyberspace.

Feminist accounts such as Turkle's which see a potential for transformation in the de- or re-gendering of an individual according to his or her desires, once the visibly sexed body is displaced, are clearly reliant on a gender/sex model.[6] In her account gender is detachable from bodies, which function as a material substrate onto which society inscribes the applicable gender roles and values. Once the sexed body is dissolved, there is no support for particular gendered identity and the de-sexed and de-gendered mind is at liberty to express its own gendered (or not) identity. In this scenario, gender/sex are in direct alignment with the mind/body opposition. If Turkle relies on a fairly simplistic model of gender identity, even more sophisticated accounts such as that of Stone (1991, 1992) draw on the compatibility of gender/sex with binary models of bodies and information to explore avenues of transformation. Disdaining the clinical precision with which uncritical models of gender segregate the biologically sexed body and the socially gendered identity, Stone sees that bodies are lived and experienced within and through the matrices of social meaning and practice. She acknowledges the complex interrelatedness of subjectivity and embodiment, particularly in the articulation of sexual identity. However, in her continued advocacy of the technologies of cyberspace as avenues for subjective transformation, she ultimately returns to a model whereby it is the exclusion of bodies that purges the subject of their social gendered identity. Thus, her analysis relies as much as Turkle's on the possibility of

distinguishing between an extra-social sexed body and a socially constructed, inscribed, gendered identity (and body).

While the mind/body dichotomy clearly informs gender/sex formulations, not just in cyberspace but more generally, it is the intersection of these binary pairs with the information/matter distinction that serves to promote gender as the most expedient avenue of transformation. In this transformational horizon, bodies are confined once more within a binary logic. Irrespective of the sophistication of understandings of the processes of embodiment and subject formation, any analysis of cyberspace that frames it as informational, in opposition to material, is bound at some point to ascribe to bodies a residual materiality, to identity and consciousness the status of information. So gender, in alignment with mind and information, becomes a particular pattern of information inscribed or embedded in the physical, but detachable under certain (technological) conditions. Thus a scenario of individual rearticulation of identity, as offered by Turkle, while openly engaged with a mind/body distinction, equally turns on an information/material dichotomy. This dichotomy does not function simply to describe the technical conditions that exclude sexed bodies from accessing cyberspace. Rather, information is also understood to be the principal condition of understanding the nature of consciousness. Social inscriptions such as gender, seen as representational and discursive, are informational processes which, when disengaged from the material, are susceptible to manipulation and reconfiguration, due to their capacity for interface with the processing and representing power of information technologies. Thus, in the transition to cyberspace, bodies with their embedded informational gender patterns are displaced, while gender as a disembodied pattern can be taken up or refused by an unattached consciousness.

Thus, it appears that the prevalence of the gender/sex model in feminist engagements with cyberspace is explained by the fact that it sits so easily with conventional accounts of the information-based status of computer mediated environments and the seemingly unavoidable recourse to this information/material dualism, mapped onto a mind/body formulation of the subject. In such projects, the functional equivalence of mind/body, information/material, is clearly articulated as the paradigm within which human-technology relationships are located and within which the prospect for transformation lies in the pliability and mobility of information. For Haraway's cyborg, information was supposed to be that which put paid to the structures of binary opposition, through the emergence of a common informational ontology, between entities and objects previously distinguished through binary oppositions. However, if information itself is articulated through an opposition to the material, and subsequently functions as the basis for other oppositions such as mind/body, gender/sex, then clearly it does little to destabilise the existing epistemological framework of modernity. Unsurprisingly, other feminist theorists of the encounter between bodies and technologies are deeply suspicious of any movement toward disembodiment or autonomous consciousness freely articulating electronic bodies. (Balsamo1993, 1995, 1996, Hayles 1993a, Sofia 1992, Lupton 1995, Vasseleu 1997) They are concerned with the consequences of so readily dispensing with bodies, as well as suspicious of the apparent straightforwardness of the separation of information from matter. Hayles wants to insist on embodiment as central to any mode of subjectivity, whether in cyberspace or the 'real' world. In her examination of the emergence of the post-human, she undertakes a theoretical excavation of the processes through which "information lost its body" and became embedded in the information/matter opposition (1999:2).

Material Information

> contemporary pressure toward dematerialization understood as an epistemic shift toward pattern/randomness away from presence/absence, affect human and textual bodies on two levels at once – as a change in the body (the material substrate) and a change in the message and the codes of representation. (Hayles 1999:29)

Hayles here concurs with Haraway, to the extent that she too sees the emergence of information technologies and discourses of information as marking an epistemic shift and the arrival of a new post-modern paradigm. She concludes that, with the arrival of the information age, the conceptual framework of presence/absence is displaced, as pattern and randomness become the defining mode of representation. In her analysis of information theory and cybernetics, she traces the theoretical and rhetorical process whereby information is separated from its physical markers and understood as able to move unchanged across any number of different material substrates. This ability to traverse varied sites, which displaces presence as information, is at any moment a distribution or pattern of elements rather than a stable presence of particular elements. This movement from presence to pattern underpins dematerialization in both cybernetics and contemporary accounts of cyberspace. That the mind/body formulation should appear as the basis for engagement in cyberspace is no accident, since cyberspace conceptualised as information space is necessarily distinct from, and incompatible with, embodied materiality.

In *How We Became Post-human* Hayles undertakes a detailed reconstruction of the extraction of information from materiality and traces how this has been accomplished, through a series of epistemological shifts, originating in cybernetics, which institute a binary structure at the very foundation of information theory:

> The point is not only is abstracting information from a material base an imaginary act but also, and more fundamentally, that conceiving of information as a thing separate from the medium instantiating it is a prior imaginary act that constructs a holistic phenomenon as an information/matter duality. (1999:13)

That is, objects, phenomena or beings are understood to be, prior to cybernetic dissection, a compendium of information plus matter. In this manner, Hayles finds that cybernetics installs a logic of identity on an ontological level. She refuses this paradigm and wants to insist that information cannot and should not be understood as entirely distinct from materiality:

> Information, like humanity, cannot exist apart from the embodiment that brings it into being as a material entity in the world; and embodiment is always instantiated, local and specific. (49)

She is not claiming that information *is* material, but rather that the relation between immaterial and material cannot be adequately explained by an oppositional framework wherein one element can be entirely separated from the other. For Hayles, information as immaterial does not and cannot exist or operate outside the context of the material conditions that create, distribute and instantiate it.

One front on which Hayles explores the impossibility of fully separating information and matter is that of bodies. In response to the dematerialising impulse of cyberspace and virtual reality, she is concerned to explore how to account for the informational status of bodies, such that materiality is restored as integral to identity. Bodies, for Hayles, are not the brute material substrate that is easily assimilated into the binary structures of mind/body, information/matter, nor are they simply a composition of distinct material and distinct information components as elaborated by cybernetics.

Rather, she identifies two distinct but complexly interrelated realms in an attempt to think through the relation of bodies to information.

The first, 'the body', she sees as the sum total of social norms and practices that work to fix a normalised and universal body, with which all subjects must endeavour to comply as it establishes the framework for social experience and understanding of bodies (197). For Hayles, this is clearly unacceptable, in so far as she takes Irigaray's point that such a body both excludes and represses a whole range of different bodies, in order to posit itself as the single and universal human body. She is more interested in the second realm, which she terms 'embodiment', understood as the individual and specific subjective experience of individual and specific bodies in a particular cultural context (197). Embodiment is by no means an unmediated experience of a natural extra-social body, but occurs in the meeting of the normative social 'body' with subjective bodily experience:

> In contrast to the body, embodiment is contextual, enwebbed within the specifics of place, time, physiology, and culture that together comprise enactment. Embodiment never coincides exactly with "the body", however that normalised concept is understood. (196)

Embodiment, for Hayles, is marked by difference and is always in excess of the social normative 'body'. Moreover it is the materiality of embodiment that in part distinguishes it from the 'body'. The body is discursive and thus able to "disappear into information"(197), but embodiment cannot perform such a disappearance, since Hayles wants to insist that it is bound to materiality. Embodiment is not just the experience of the materiality of individual bodies, but also that experience as mediated through social frameworks such as the body. For her, the social inscription of bodies occurs in the

meeting of the 'body' with individual bodies in the process of embodiment. This is how the information (body) and the materiality of bodies are meshed. It is also on this basis that she finds it impossible to contemplate any radical separation of the two. Her task, then, becomes to "articulate embodiment and body together" (156), to explore the points of connection between the discursive and the material, to discern the complex and inextricable ways in which materiality supports and is tied to information. Such an undertaking clearly problematises the seemingly simple options of disembodied or electronically embodied identities current in discourses of cyberspace. Rather, it insists that information is not simply a value-free movement of pattern and randomness, but rather is embedded in material realities that are very much tied up in social and cultural contexts. Information is thus equally bound to social formulations and institutions and, as such, cannot be embraced as a transparent medium in which to articulate identity free from social constraints.

For Hayles, if information can be embedded in materiality it becomes infected with difference and as such cannot function as the privileged side of an information/matter binary within the logic of identity. Thus the multitude of different bodies of embodiment (materially and experientially different) cannot be subordinated to the normative (information) 'body'. While akin to Irigaray in her identification of bodies as active and positive sites of difference, and in her understanding of the oppressive and exclusionary nature of the logic of identity, Hayles remains unable to move beyond this logic. As much as she wants to insist on the inextricability of information from matter, of embodiment from the 'body', her schema itself preserves a binary relation between the two. The difficulty lies with her conception of embodiment as the individual's experience of their bodies as one that might not concur with the socially constructed

discursive body. In order that there be incompatibility, there must be some prior, extra-social body which individuals experience. In this way, the bodies that are subjectively experienced in the processes and performances of embodiment dwell, at least to some degree, outside the discursive and in a state of materiality beyond social mediation. The bodies of embodiment are distinct from the discursive body as restrictive norm. This is how Hayles would reinstate difference as well as materiality. However, to the extent that the differences of the body of embodiment are articulated through subjective experience of it as a located, active, and incompatible body, the bodies of embodiment are drawn once more into a relationship with the 'body' that is binary:

> Embodiment cannot exist without a material structure that always deviates in some measure from its abstract representations. (199)

Material embodied bodies are always different from the discursive 'body', but they are always accounted for in terms of difference *from* it and not in autonomous and specific terms. Thus, an oppositional relationship is installed between information (body)/ material (body), where material bodies are accounted for only in terms of difference of degree from the information 'body'. As we have seen, this figuration of difference in terms of deviation from the same is at the cornerstone of the operations of the logic of identity.

Thus, the formulation of body and embodiment, while an attempt to bind information to matter, ultimately also reiterates them in a binary relation. In so far as embodiment is articulated and experienced through the encounter of two distinct components, a material differentiated body and a normative information 'body', it does suggest a complex relation between the information and material components. However, to the

extent that Hayles sees difference and thus resistance lying in the matter of bodies, she is depending on the same assumption as the advocates of disembodiment and the virtual body, though clearly with a different emphasis. That is, bodies are primarily matter, in opposition to a social 'body', which is information. Thus, while cyber enthusiasts might dislodge their material bodies, Hayles is attempting to dislodge the social 'body', and both movements turn on an information/matter opposition. While Hayles might inadvertently reiterate a logic she is seeking to displace, she does make an important intervention into the discourses of cyberspace. in so far as she demonstrates that information, far from being a value-free, transparent medium, is always implicated in social processes and relations of power. Moreover, the conceptualising of information as essentially disembodied is the outcome of a historical process rather than an intrinsic fact. The understanding of information as opposed to matter arises through particular conceptual frameworks that are characterised by the logic of identity. This understanding of information, for Hayles, renders problematic the simple formulae for transformation which not only aim to free consciousness from social control, but also entail the dissolution of the human and the arrival of the post-human.

Decomposing the Human - The Post-human Body

In cyberspace information radically repositions the body, to the extent that it can no longer function as the locus for identity such that the very existence of the human is called into question. Over and above displacing gendered identities, for feminists, such as Stone, Haraway, and Plant, this displacement of the human seems to suggest the possibility of displacing Man. Technologies are significant in that it is their intersections with bodies that give rise to the possibility of identity outside the conventional category of human. And these possibilities are to a large extent dependent

on the disruption of human bodies. Technologies, however, are not the only avenue for such bodily disruption. While Haraway's cyborg looms large over the field of non-human entities, for other scholars the human body is under pressure on a variety of fronts, including viral infection, bodybuilding, cosmetic surgery and other medical intervention, and body ornamentation. Bodies are rewritten and re-marked by infection, permeability, self-directed mutation and chemical manipulation. Technologies and everyday practices intervene to rework the once stable substrate of humanness and, in doing so, compromise the human by irretrievably mixing it with microbes, chemicals, training practices, metals and meanings. Such mixing is considered to breach the borders between the human body and non-human objects and practices, to the extent that the body itself becomes non-human, and the human deprived of its bodily singularity can no longer be sustained, evolving into a post-human state.[7] This approach sees that the logic of identity which articulates the human can be shifted by reconfiguring the surfaces and interiors of the body, such that the human, as Man, as the subjective 'I', can no longer function as the anchor of that logic.

Tiziana Terranova succinctly outlines the general expectation for post-human change that technologies are a significant factor in precipitating:

> there has been a huge ontological shift not only in the nature of human society, but in that of our very bodies. This mutation has been brought about, on the one hand, by the exposure to simulated images in the most traditional media, and on the other, by the slow penetration into our daily life of almost invisible technological gadgets, from contact lenses to personal computers. This process of 'invasion' of the human body and psyche by the machine is destined to increase over the year ... and give rise to a potentially new race of human beings whose symbiosis with the machine will be total. (1996:167)

The potential for displacing Man, through a decomposition of the human effected in part by technological intervention, is the basis for much feminist interest in the emerging domain of cyberspace. Under the auspices of cyberspace, we have seen how the emerging cultures of information space, technologically mediated interaction and cybernetics have been incorporated into the project of re-writing and re-building the (human) body, in such a way that individuals and society are permanently transformed. However, counter to this, I have argued that to the extent that transformational accounts elaborate bodies and subjectivity through a matrix of sex/gender, mind/body and information/matter binary oppositions, they remain contained within the epistemological frameworks of modernity and the possibility of transformation therefore remains limited.

In the previous chapter, we saw the necessity of recasting the prevailing configuration of the human as Man as subjective 'I'. In terms of knowledge, this requires a displacement of the logic of identity and the associated structure of binary opposition, through which the human is articulated via a movement of exclusion and obliteration of difference. Irigaray has shown the inherent instability of this structure in terms of its inability to establish an uncontaminated self-present identity because of an unacknowledged dependence on the other. Thus the category of human is always adulterated by the non-human. Haraway pursues the assault on the human along another line, by insisting that the 'human' body, as the privileged bounded container of the human, is contaminated by non-human technological devices and discourses. For both, any notion of the post-human could only arise from the conceptual breakdown of the frameworks of knowledge that configure the human (as Man). I argued in the previous chapter that the notion of the post-human is problematic, as it takes as its point of departure a certain

understanding of the human against which it is formed in terms of difference from. As Hayles astutely notes, the erasure of body that post-humanism effects is the same one on which the human is grounded (1999:4). This insight is echoed by those who identify, in the pursuit of information technology driven transformation, not a disruption of the 'human' body but a reactionary rearguard action to reinstate the centrality of the human (as Man). They identify, across a range of technological interventions into bodies, attempts to stave off the destabilising forces of theoretical deconstruction of the human, as well as its technologically driven fragmentation.

Recomposing the Human

One such attempt, according to Anne Balsamo, arises in response to feminism's exposure of the human body as one which is far from neutral and as constituted within a hierarchy of power. She identifies a distinctly conservative and recuperative stake in the advocacy of transformation through disembodied consciousness:

> The disappearing body is a gendered response to cultural anxieties about body invasion. Masculinist dreams of body transcendence and relatedly, masculinist attempts at body repression, signal a desire to return to the 'neutrality' of the body, to be rid of the culturally marked body. (1993:233)

She sees that the privileged position of the white male body, as the marker of a neutral 'human', is increasingly difficult to maintain in the face of feminist, post-colonial and post-structural theorising which identifies the conceptual commitments and exclusions that underwrite this neutrality. Moreover, the body as a cultural entity is immediately interpolated into relations of power that preclude any possibility of it being neutral. Balsamo suggests that the movement of dispensation with the body, occurring in discourses of cyberspace, might not be the hoped for gesture of radical displacement of

the human. In displacing the culturally marked bodies that problematise the neutral 'human' body, she sees how the human is able to recapture its universality and generality. That is, once relegated to a materiality that cannot traverse electronic space, materially and inscriptively different bodies become homogenised under the 'body' side of a mind/body dichotomy. In this way it is possible to talk about a single 'human' body again, having at the very least raised the possibility that there is some residual general body onto which social inscription is laid. Thus, the mind/body dichotomy that effects this division, in tandem with the information/matter distinction, works to establish unified categories, which deny difference – material and cultural – and which are amenable to the reiteration of the human as a universal, singular category. In this manner, the differing, excessive and unstable bodies identified by feminism become conflated into a single category of 'body', which takes on universal human status in a movement of erasure of difference.

David Ellison's analysis of the Visible Human Project also detects this movement to reinstate the white male body as the marker of a universal human. The project consists of dissecting a newly dead 'healthy' cadaver into fine slices, which are then scanned into a database. The sections are compiled so that a complete human body, interior and exterior, is visible and can be pulled apart for detailed scrutiny. The body chosen as the visible 'human' was that of a young, white, male, executed for murder in a Texas state prison. Irony aside, Ellison finds that the Visible Human Project represents another technological attempt to establish a normative body as neutral and natural, in the face of categorical and material fragmentation:

> At a time when the emergent identity claims of the gendered body, the gay body of AIDS activism, the post colonial body, and the indigenous body are all demanding space in the public sphere, the VHP looks a bit like damage control, a return of the dead, white male to pre-eminent visibility. (1996:35)

A year or so later, a visible 'woman' had been dissected and stored in a database. However, I would argue that this does not displace the white male as the marker of the human. The visible 'woman' was imagined as a companion piece or complement to the first Human, Eve to his Adam, thus reiterating the status of woman as supplement or complement to man identified by Irigaray. As a project to make visible the human, the inclusion of both male and female bodies posits a commonality and, in beginning with the male, inevitably positions the female in a relation of being *different from* the original (visible) Human. The conceptual framework which Irigaray demonstrated as the basis for modern Man is thus operational in the way a project such as this is both conceptualised and carried out. Bodies are here engaged with purely as material objects, literally a slab of meat to be sliced and informatized. They are stripped, not only of the energies and capacities that animate them, but also of any social inscription and involvement in frameworks of knowledge that might endow them with meaning and value. The human body, as made visible in this project, is fundamentally exterior to the social: its materiality is converted into information, but that information is neutral and uncontaminated by social discourses or practices (such as criminality). Thus the Visible Human arrives via a different route at the same point as Balsamo's account of disembodied consciousness. The residual matter of the body achieves the self-evident visibility and neutrality of the human, once consciousness and the attached understandings and experiences of bodies, instigated through social practice and discourse, are removed (by lethal injection in this instance). In this manner, any theoretical, material or social fragmentation is once again erased:

> Even as science and technology are challenging time-honored ideas about what it means to be human the body is being transformed into a combat zone by skirmishes over abortion rights, AIDS treatment, foetal tissue use, assisted suicide, euthanasia, surrogate mothering, genetic engineering & cloning. (Dery 1996:28)

In the late twentieth century, the body has become a site under siege by nature, culture and epistemology, all of which undermine the categorical stability of the human. In response to these threats, the impulse to abandon the body, or re-represent it electronically, might appear less an attempt to liberate consciousness than a means to avoid the representational threats posed by the realisation of the impossibility of a stable, integrated, singular human body. The mind/body opposition, on which the movements of disembodiment and virtualisation of the body turn, actively works towards a reintegration of the fragmented and disparate bodies Balsamo, Dery and Ellison describe. In their elaboration through the binary framework, as the opposite of mind, the differences between bodies are erased: they become simply en masse 'not-mind', in line with the operations of the logic of identity. In this manner, the mind/body opposition, particularly in its association with the information/matter opposition, works to reiterate the human, as man.

Epistemological Persistence

On the one hand, transformation and transcendence of the 'human' body through technological intervention becomes an attempt to eliminate the compromised and restrictive categories of subjectivity and to explore new possibilities. On the other, the very methods proposed for enacting this transformation and transcendence lead back to the hierarchical structures that elaborate the human as man within a logic of identity. In this contradiction, we can see the principal difficulty that arises in attempting to evaluate

the possibilities of subjective transformation of new technologies. This is that new technologies are theorized through the subjective and instrumental frameworks both Foucault and Heidegger made problematic. As such, the technologies are simply interpolated into existing relations of power and frameworks of knowledge through which subjects are articulated. The framing of cyber and virtual reality technologies in terms of an information/material paradigm provides a clear example. In instituting a strict opposition between the two terms, the meetings of technologies and bodies almost inevitably become a movement of elaboration of an information mind/material body binary opposition. The conservative and recuperative function of the oppositions gives weight to the claims of difference feminism that the logic of identity and the associated binary structure need to be challenged. Bodies, whether theorized in transformative or recuperative projects, are inevitably denied autonomous difference within this structure. In this manner bodies are repeatedly articulated into binary relations, with the mind, with information, with the non-human, with machines. It is the reiteration of those relations as *oppositional* that serves a conservative purpose and, as such, they cannot be proffered as conditions of possible liberation.

Given that the prevailing transformative scenarios of cyberspace remain embedded within the epistemological framework of identity, it is difficult to sustain the argument that cyberspace is symptomatic of an epistemic shift, or that the modes of subjectivity it facilitates are radically different from Man as subjective 'I'. This difficulty is evident on two main fronts. The first is the consistent and seemingly unavoidable reiteration of the structure of binary oppositions. In the accounts of embodiment that circulate in accounts of cyberspace, difference is consistently squeezed into a binary structure that erases it. Information/matter becomes the guiding frame, through which the meetings of

bodies and technologies are understood, with the resulting elaboration of bodies in an oppositional relation to mind. Bodily sexual difference is framed within a sex/gender opposition, which erases it, but which fits neatly with the information/matter account of bodies' relations to technologies. Thus the binary logic, as symptomatic of a more general logic of identity, structures the entire field of such transformational scenarios for cyberspace, and to that extent they are fundamentally flawed.

The second front where these transformative accounts fall short is the understanding of technology from which they proceed. Technologies of cyberspace are understood as having some 'effect' on an embodied subject. At the interface between the virtual realities or electronic environments of cyberspace and the embodied subject, information technologies instigate and maintain a division between a material body and an information mind. Technology as information gatekeeper effectively excludes the material. In such a scenario, technology is understood as that which is added to, or impacts upon, an embodied subject, in a straight forward prosthetic encounter of 1 + 1. As we have seen, this equation is founded on the operations of the logic of identity and, as such, it is no accident that the subsequent elaboration of the effects of these meeting are equally contained and shaped by that logic. Secondly, this is a subjective and instrumental account of technology. Subjects are understood to be able to use new technologies as instruments to rearticulate themselves. Thus, while the technologies and social spaces of cyberspace may indeed offer new modes of communication and representation, to the extent that they remain understood and encountered through the prevailing epistemological framework they inevitably fall short of articulating an epistemic shift, or a radical transformation of subjectivity.

For feminists concerned with thinking sexual difference as autonomous difference, there is little possibility of doing so within an understanding of the technologies and social field of cyberspace developed within, and grounded on, the logic of identity. An alternative means is required for thinking technologies, bodies and the intersections between them, other than through the subjective and instrumental prosthetic equation based on that logic. Such a means will necessitate a fundamental reconceptualisation not only of the nature of the encounters between bodies and technologies, but also a shift in the conceptual framework through which they are articulated and apprehended. In the next chapter, I look to the work of Deleuze and Guattari for such an approach.

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[1] Definitions of cyberspace abound and reflect the different contexts from which they emerge, including science fiction, popular science, information and computer science, cybernetics, sociology, anthropology, rhetoric and critical theory. Kitchen (1998) gives a good overview of the various definitions and inflections of the term cyberspace (P 170. Note 3). Given that this project is concerned with examining how the technologies and social practices of cyberspace are understood and configured through epistemological orders and conceptual categories rather than pursuing the question of what cyberspace *is*, in this chapter I will be using the term in the most generally accepted sense of the interactive social spaces created through networked information and communication technologies.

[2] William Gibson's 1984 novel *Neuromancer* is widely credited with coining the term 'cyberspace' and many of the associated defining characteristics, particularly that of disembodied information space and the social nature of cyberspace as a 'consensual hallucination'.

[3] Prominent science fiction texts on cyberspace which attract analysis include Neal Stephenson (1992) *Snowcrash*, Bruce Sterlings *Schismatrix* (1985) and Pat Cadigan (1991) *Synners* as well as the collection of cyberpunk works compiled by Bruce Sterling (1986) *Mirrorshades: A Cyberpunk Anthology*. These texts all examine at some point the impact of information technologies on bodies and explore a range of embodiment options including disembodied consciousness, avatars, cyborgs, computer simulations and so on.

[4] Even the most complex and sophisticated elaborations of the construction and mobilization of categories of sex and gender such as those of Judith Butler in *Gender Trouble* (1990) and *Bodies that Matter* (1993) maintain the two as distinct categories which do different things and have different relations to bodies.

[5] Gatens goes on to argue that if we understand social practices such as gender as operating not in the realm of consciousness, nor simply on the matter of the body, but through the fabric of embodied subjectivity, then it is not possible to neatly separate sexed bodies and gendered consciousness. For Gatens, "masculinity and femininity as forms of sex-appropriate behaviours are manifestations of an historically based, culturally shared phantasy about male and female bodies, and as such sex and gender are not arbitrarily connected (1996:13)." This has some resonances with constructivist accounts of bodies, but importantly it insists on subjectivity as a product of the social constitution of both mind and body in a manner in which they are inseparable from each other.

[6] See also Bruckman (1993), Chua (1996), Cherney (1996) and (Stone 1991).

[7] 'Post-human' like post-modern, has a range of inflections. It can refer to the epistemological dissolution of the human as a category and figure, as well as post-humanism – in terms of the supersession of humanism as the master narrative by post-modernism. Technological development is implicated in both senses – for example in Haraway's claims that the intimate relations between humans and technologies render untenable the closed boundaries of human bodies, and thus destabilise the category of human itself. In terms of anti-humanism discourses such as cybernetics, molecular biologies and genetics displace the

epistemological centrality of human consciousness. Judith Halberstam argues that post-modernism and post-human bodies are inseparable:

> Post human bodies are the causes and effects of postmodern relations of power and pleasure, virtuality and reality, sex and its consequences. The posthuman body is a technology, a screen, a projected image; it is a body under the sign of AIDS, a contaminated body, a deadly body, a techno-body ... The human body itself is no longer part of "the family of man" ... (1995:3)

Chapter 5

Deleuze and Guattari: Assembling Bodies

Everything is a machine.

Gilles Deleuze and Felix Guattari. *Anti Oedipus*

As we saw in the first three chapters, the pursuit of transformation by feminists address the conceptual frameworks and modes of knowledge that determine how and what can be known. For feminists exploring the transformative possibilities of technology this implies that, unless technology can be thought other than through the established framework of identity, it offers little prospect of radical transformation. In chapter four, we saw this to be the case in the instance of cyberspace, where the technologies and practices remained conceptualised within the prevailing logic of identity, as evidenced by the modes and models of embodiment articulated there. The task for feminists, then, becomes to seek an alternative conceptual framework through which to apprehend and understand the technological and bodily arrangements of cyberspace. Such a framework must work not only to displace the logic of identity as ground, but also to elaborate a conceptual horizon within which thinking transformation becomes possible. In this chapter, I want to explore a range of concepts, developed by Deleuze and Guattari, which I will argue make just such a conceptual shift.

In the previous chapter, an examination of the dominant formulations of bodies, technologies, and their interaction, brought to light two significant conceptual obstacles that undermine claims regarding the radical transformative possibilities of cyberspace. These were: a persistent recourse to a logic of identity and the predominance of a prosthetic understanding of technology. In accounts of embodiment and cyberspace these difficulties emerged both from a general understanding of the scope and nature of relations between technology and embodied subjects and from a particular conception of the mode of operation of information technology as the key constitutive component of cyberspace. The conceptual framework through which those understandings were elaborated is characterised by a series of binary oppositions, particularly those of

information/matter, mind/body, and human/machine. This persistence of the logic of identity cannot be overturned by simply altering the relative position or value of a term within a binary. Rather, it requires a radical rethinking of the status of difference, such that it can be accounted for other than in terms of a difference based on identity or sameness, as articulated within a binary logic. Difference needs to be figured other than as determined in relation to the dominant term of the pair, other than the diminution, negation, absence or variation of that term. Rather than being attributed object status, defined only in relation to an identified subject, the specificity and singularity of objects, the first being woman, according to Irigaray, might thus be thought (1985:133). In addition, to apprehend difference other than through a deterministic framework such as identity, will open up the possibility for the emergence of undetermined, radically different, transformed futures.

Such rethinking clearly requires a broad conceptual shift and, in this chapter, I examine how Deleuze and Guattari effect such a shift. Both individually and in their co-authored works, Deleuze and Guattari pursue many and varied philosophical questions across a creative, complex, and idiosyncratic body of work. Crucial to this project, and prominent in theirs, is the problematising of identity and an interest in thinking difference other than as sameness. Their project ranges well beyond a critique of the elaboration and operation of binary logic. As Grosz points out they are engaged in a wholesale rethinking of western metaphysics:

> Not only do they seek out alternatives to contest or bypass the metaphysical bases of Western philosophy (which Derrida terms 'logocentrism': the immediacy of givenness of presence), they seek to position metaphysical identities and theoretical models in a context which renders them merely effects or surface phenomena within a broader or differently conceived ontology or metaphysics. (1993:169)

Such a reconfiguring of metaphysics clearly implies a radical reorientation of the frameworks of knowledge, through which things are apprehended, ordered and thus understood. As I argued earlier, it is just such a reworking of the founding conceptual structures that is necessary for feminist transformative projects concerned with articulating difference. Clearly, reconceptualising ontological difference is a large and complex undertaking. However, in this thesis I am pursuing the more modest aim of making some preliminary sketches of a conceptual horizon that might be more open to thinking transformation. Such a conceptual horizon would allow bodies, technologies, objects, subjects, matter, information, and the nature and scope of their interactions to be thought other than through the framework of identity and, thus, open them to the possibility of radical transformation.

Deleuze and Guattari offer many lines of inquiry into the question at hand. In this chapter, I want to take one of their concepts, that of the assemblage, as the initial launching point for a more wide-ranging theoretical exploration of the question of difference.[1] Approaching the question of bodies, technologies and their relations in terms of assemblages provides initial insight into how Deleuze and Guattari's approach might avoid the pitfalls of identity, to which cyber-discourse is prone, as well as opening onto larger questions of the positive articulation of difference. Like most Deleuzian concepts, that of assemblage is deployed in a multitude of contexts, used interchangeably with other terms, and carries complex and nuanced resonances. I do not therefore intend to proceed by constructing a single definitive model of an assemblage. Rather, I want to begin by outlining the general characteristics of the concept, such that the nature of the broader conceptual shift, which I claim the concept marks, will become

apparent. This approach follows in spirit that of Deleuze and Guattari, in so far as I am less interested in outlining definitively what assemblages are, than in exploring how they function and what they do, how the concept of assemblage apprehends and accounts for difference and the strategies it might suggest for feminist projects of transformation.

I want begin my exploration of the concept of assemblage through the question of bodies and technologies. As we saw in the previous two chapters, bodies prove to be a particularly telling site in terms of discerning how difference is elaborated. By examining how the notion of assemblage might apprehend and explain bodies, the more fundamental conceptual shifts Deleuze and Guattari make become apparent. Clearly, this approach will lead us very quickly from concrete questions of bodies and technologies to those of knowledge, epistemology and ontology. In the second half of this chapter, I will follow those trajectories through a variety of interrelated concepts Deleuze and Guattari develop, including multiplicity, becoming, event, virtual and actual. In this manner, I hope to show how their conceptual horizon demands a radically revised understanding not simply of the relations between bodies and technologies, but of the notion of difference itself.

Assembling Bodies and Technologies

As we have seen, the prevalence of a prosthetic understanding of body/technology interaction in analyses of cyberspace produces a persistent reiteration, not only of binary oppositions, but also of a generalised founding identity. The difficulty with the prosthetic is that, as a formulation explaining the meeting of one term/entity with another, it assumes the terms are possessed of a unified identity prior to such meeting. Hybrid entities such as the cyborg exemplify this formula: the body and the machine

meet and meld and give rise to something else. This is equally the case in the instances of technological disembodiment or digitalisation of bodies, where the information technologies of cyberspace, on meeting a body, either exclude it or translate it into information. In such scenarios a prior, unified, self-identical body meets a prior, unified, self-identical technology. No matter what the extent of transformation that arises from such an encounter it remains contained within a framework of identity. Clearly, what is required for feminist projects concerned with articulating difference is a way to account for the meetings of bodies and technologies that does not proceed from the assumption of a prior, self-identical body or technology. Moreover, it requires a means to explain those meetings that does not, in tracing the outcomes of those interminglings, invariably articulate differences into binary oppositions such as information/matter, mind/body. So long as bodies and technologies are thought only through the frameworks of identity, their combination cannot give rise to radically transformed new configurations. In the last instance, any mutant formation remains articulated within the dominant framework and its difference understood only in relation to the forms that preceded it. Transformation is short circuited within any formulation in which emerging configurations are explicable only in terms of *difference from* preceding forms and, thus, articulated in relation to the same. Clearly, technologies cannot in their encounters with bodies give rise to radical transformation within this understanding and so a new means of thinking both bodies and technologies is therefore required.

Grosz finds in Deleuze and Guattari's concept of assemblage a means of thinking bodies other than through oppositional categories. She suggests that it also reframes

understandings of encounters between bodies and other objects, including the technological. According to Grosz, the body thought in terms of assemblage presents:

> an altogether different way of understanding the body in its connections with other bodies, both human and non-human, animate and inanimate, linking organs and biological processes to material objects and social practices while refusing to subordinate the body to a unit of a homogeneity of the kind provided by the body's subordination to consciousness or to biological organisations. (1994:165)

Here Grosz signals a number of key shifts which the concept of assemblage marks: a refusal of identity or unity as ground or ordering logic; a shift in the relation between the parts and the whole; and a focus on the movements of linkage and connection. These strategies are complexly interrelated and, in this chapter, I want to explore, through a consideration of bodies and technologies, how such strategies offer both an alternative to the prosthetic and, more generally, a means of apprehending difference.

Assemblages are functional conglomerations of elements, but importantly the component elements are not taken to be unified, stable or self-identical entities or objects. That is, they are not grounded on a prior unity. In each assemblage the particles, intensities, forces and flows of components meet with and link with the forces and flows of the other components: the resultant distribution of these meetings constitutes the assemblage. This formulation obviously presents a challenge to a straightforward prosthetic account of the meeting of bodies and technologies, where a pre-existent unified body, and technology meet. I want to examine the body half of the prosthetic equation in order to explore how, in reformulating both the status and composition of the components, and the manner of encounter between components, the concept of assemblage renders the prosthetic unworkable. Such a consideration of how bodies might be thought, both as assemblages and as components of other assemblages,

will reveal the conceptual shifts Grosz signals and which, I would argue, offer an alternative to identity and prosthesis.

Taking the body as figured in psychoanalysis as an example of the unified body of the prosthetic encounter, we can begin to sketch out where a model of bodies as assemblages might diverge. In reference to Freud's case study of little Hans, Deleuze and Guattari propose an understanding of embodiment very different from the elaboration of a coherent and unified body subordinated to consciousness outlined in psychoanalysis. Psychoanalysis describes how bodily functions, sensations and drives are integrated into a coherent unified body, through the imposition or acquisition of a particular social inscription in the process of Oedipalization. This is a process both of social overcoding of the bodily impulses and forms, that is, the attribution of specific meanings to bodily organs, and of the formation of a subjective depth or consciousness, which equally functions to unify a fragmented body. A failure of integration, as in the case of little Hans, gives rise to neurotic symptoms. These symptoms represent 'unnatural' or aberrant understandings, or investments, of particular bodily functions or impulses, which are no longer consistent with the unified and coherent 'social' body. Their status as symptoms also at once suggests that they are manifestations of some process occurring elsewhere. In the case of psychoanalysis they are symptomatic of a process occurring in the unconscious. Thus, bodily experiences and investments, whether integrated or aberrant, suppose a body that is unified, in which organs and impulses have designated meanings, and in which unity is achieved through a structure of internal depth.

In thinking bodies in terms of assemblages, Deleuze and Guattari want to contest this understanding of the 'body' as a unity, through which organic materials, processes,

energies and capacities are ordered and constrained.[2] They refuse the subordination of the parts to the whole, that is, the explanation of bodily forces and experience through the overarching structure of a unified body. In doing so, they also refuse the model of subjective depth, since this functions as a mechanism of unification. In contrast, they see the bodily investments and actions considered as neurotic symptoms not as manifestations of a real cause located somewhere in the psychic depths of the unconscious, but rather as occurring entirely on the surface. Symptoms do not therefore represent the rupture of a unified whole and cannot be 'cured' through reintegration into a whole. Rather, a body is itself an assemblage, a collection of just such connections, 'symptoms' and attributes, neither ordered nor unified, via the subject, into 'a' body or even fixed organs, as organised and integrated parts of that body:

> When little Hans talks about a "peepee-maker" he is referring not to an organ or an organic function but basically a material, in other words, an aggregate whose elements vary according to its connections, it relations or movement and rest, the different individuated assemblages it enters. (Deleuze & Guattari. 1987:256)

For Deleuze and Guattari, bodies are collections of disparate flows, materials, impulses, intensities and practices, which congeal under particular and specific conditions, in complex relations with the flows and intensities of surrounding objects, to produce transitory but functional assemblages. Such an understanding is clearly at odds with that of a unified body, where organs and energies find their meaning and function through their integration into a unified whole. Rather, as assemblages, bodies are understood as "discontinuous, nontotalizable series of processes, organs, flows, energies, corporeal substances and incorporeal events, speeds and durations..." (Grosz 1994:164).

If bodies are thought as assemblages of disparate matters and energies, the next question must then be, how can we explain the appearance of particular bodies without reinscribing an overarching unity on the component elements? Or, in other words, how are particular bodies assembled, or how can we describe or discern particular arrangements of component elements that might constitute located functional bodies? For Deleuze and Guattari, it is as elements of larger assemblages that particular bodies are assembled. Configuration of the disparate and mobile elements of bodies and the appearance of particular bodies occurs within complex assemblages of other bodies, objects, institutions, technologies, regimes of signs and relations of power, which achieve a meta-stability. Bodies as assemblages find particular configurations within broader assemblages in the connections, linkages and exchanges with the other component elements of those assemblages.

In so far as I have been describing the process of bodies being assembled and achieving localised form, function and meaning through their linkages and interactions with other components of assemblages, there might appear to be some resonance with a broadly social constructivist model. Indeed Deleuze and Guattari do describe their work as constructionism (Deleuze. 1995:147). However, the difference between their understanding of constructivism and that of social constructivist models is apparent in their respective formulations of bodies. Within the generally constructivist understanding, bodies become articulated and understood through the particular social context into which they are inserted. For example, bodies as social constructions are understood to be the interpolation of the biological body into a matrix of meaning that overcodes it and produces a particular understanding and experience of it for the subject which inhabits it. This is a two way process, in which a particular understanding of the

body contributes to the construction of a gendered identity and the acquisition of that gendered identity reiterates the particular understanding of the body. While I have critiqued this model in the previous chapter, on the grounds that it belongs to the logic of identity, here I want to contrast it with the formulation of assemblages. Such a constructivist model presumes a pre-social, pre-discursive body, relatively stable and available for overcoding. While this pre-social body may be socially unintelligible, it is nonetheless presupposed as an object available for social inscription. Even in sophisticated accounts like Butler's, in which pre-discursive sexed bodies are articulated only through discourse, to the extent that she posits a pre-discursive 'outside', whatever its relation with discourse, she is also positing a pre-social body which is then grasped by the social (Colebrook & Bray 1998:42).[3] Thus, unlike an assemblage there is presupposition of an enduring identity of components, for example sexed bodies prior to the contextualising or constructing process, in this instance gendering. The constructivist model, to the extent that it proceeds through the interpolation of those elements into an existent social framework, also functions as a whole to which the parts are subordinated. Sexually different bodies are coded and ordered through their interpolation into a unified field of social institutions, practices and discourses such as medicine, family, psychoanalysis and so on. Deleuze and Guattari contend that assemblages function along entirely different lines.

Assemblages do not function as transcendent social orders that determine and distribute component elements; rather, the concept of assemblage recasts the notion of context, such that it can no longer be understood as an existing structure into which elements are interpolated. In terms of assemblage, context describes the provisional, transitory and entirely contingent functional amalgams of the disparate component elements. These

'components' are not understood as prior stable entities, nor are 'contexts' understood as pre-existent fields into which component elements are funnelled. In contrast, the notion of an assemblage reorients the relation of the whole to the parts. In assemblages, the 'social' as a whole does not function as an overarching structure, which orders the component parts, just as the 'body' as a whole does not order component matter and energies. Rather, in each instance. it is the aggregate of the parts that constitutes the whole assemblage. The specific connections and compositions of components constitute a specific and immanent whole. Thus the 'social' is equally assembled and does not precede, in any total or fixed form, the various assemblages in which its elements encounter bodies (or technologies). 'Social context' is equally articulated via the process of assembling, that is, given localised form, function and motility. Each of its elements takes its meaning and becomes operational entirely within the context of the assemblage and is constituted equally by and in its relations with all other objects in the assemblage, such that nothing comes first and there is no originary moment or transcendent structure. Thus, an assemblage does not proceed by way of distinct unities coming to bear on each other within an already established framework, but on entities and forms, discourses and institutions, achieving mutual and localised constitution and becoming operational within the context of the particular assemblage within which they are articulated. This is not to say, of course, that assemblages are essentially egalitarian and entirely accidental: on the contrary, according to Deleuze and Guattari, power relations are very much at play within assemblages. They are, however, operational on an immanent level and do not function as an overarching structure, through which the component elements of an assemblage are ordered.

For Deleuze and Guattari, assemblages operate as functional units, within which disparate elements mix and form linkages in ways that constitute their localised form, function and meaning. The elements that compose an assemblage cannot be understood as stable, individuated and self identical, prior to their engagement in an assemblage, but rather as composites of unformed flows and partial fragments of information, matter, ideas, particles, movements and intensities, which coalesce into particular recognisable forms and functions within the context of particular assemblages. Thus, while bodies are an undeniable concoction of material components, chemical compounds and electrical impulses, such elements are not fixed into an immutable order or unity, but are continually in flux and in commerce with the circumstances, energies, fields of objects and discourses through which they find particular temporary articulations. For Deleuze and Guattari, a self-identical body (or object) cannot be identified prior to, or outside of, the field of encounters that articulate it within any specific assemblage. There is no originary whole body that is decomposed into organs, movements, pieces, forces, or information flows, which are then recomposed into particular configurations within an assemblage. Rather bodies and other components of an assemblage are multiplicities and, as such, cannot be traced back to an originary unity. Assemblages are thus never simple aggregates or arrangements of already stable components, which meet along prosthetic lines:

> For the moment, we will note that assemblages have elements (or multiplicities) of several kinds: human, social, and technical machines ... We can no longer even speak of distinct machines, only of types of interpenetrating multiplicities that at any given moment form a single machinic assemblage... (Deleuze & Guattari 1987:36)

To think assemblages as interpenetrating multiplicities offers a formulation which is radically different to the prosthetic in two ways: firstly, the mode of encounter is no

longer that of one object meeting another, but of linkage, exchange and connection; and secondly, the components of any encounter are multiplicities themselves, rather than unified objects. Beyond offering an alternative to a prosthetic formulation of encounters between objects, the concept of multiplicity is indicative of the broader conceptual shift Deleuze and Guattari are proposing.

Multiplicities and Multiples

The concept of multiplicity is crucial in terms of formulating a conceptual horizon within which difference is refigured. It reflects the shift Grosz flagged, whereby unity and identity are no longer organising principles. To approach assemblages and their components as multiplicities offers a strategic means to avoid taking up the logic of identity as the principal explanatory framework of events and objects. Through the concept of multiplicity, the possibility is raised of an epistemological framework that apprehends difference other than through identity:

> Let us return to the story of *multiplicity*, for the creation of this substantive marks a very important moment. It was created precisely in order to escape the abstract opposition between the multiple and the one, to escape dialectics, to succeed in conceiving the multiple in a pure state, to cease treating it as a numerical fragment of a lost Unity of Totality or as the organic element of a Unity or Totality yet to come, and instead distinguish between different types of multiplicity. (32)

For Deleuze and Guattari, the concept of multiplicity is crucial in moving away from a framework of identity and sameness and beginning to think difference in another register. They examine two types of multiplicity, characterised by two different modes of apprehending difference: the first is that of the One and Multiple, which frames difference only in terms of *degree*; the second, a mode of multiplicity, which apprehends difference as differences in *kind*.

As we have seen, within the logic of identity difference is understood only in relation to a determining identity, that is, in terms of its degree of divergence from that identity. The structure of difference in degree is ordered around an original One, Identity or Unity as central reference point. It is structured around a central term that functions as the determining factor from which all difference is understood in terms of diminution, absence, distancing or magnitude. Differentiated elements are not understood to be of another order, or possessed of any distinct autonomous attributes or qualities, but are always accounted for and understood in relation to the centre. The multiplicity characterised by difference in degree is that understood as composed of an aggregation or set of discrete unities: 1 + 1 + 1. Difference in degree underpins this model to the extent that each element or entity in the multiplicity is understood as self-identical and capable of being aggregated, i so far as they are discrete – different *from* – each other. According to Deleuze, such multiplicities are discontinuous and homogenous (1991:38). They are discontinuous in that they are comprised of discrete units and homogenous in so far as the multiplicity is quantitative, whereby its components can be accounted for with a single measure. Within the aggregation of the multiple, the individual elements can always be identified and understood as self-identical units, as 1's. The multiple here is clearly one of extensive magnitude. As such, Constantin Boundas explains, any change in the multiplicity is a matter of increase or decrease of quantity and does not alter the nature of the components or the multiplicity (1996:83).

The second type of multiplicity is of an entirely different order: it is characterised by differences in kind. Difference in kind is difference that is not articulated in relation to a prior unity, identity or central determinate. They are different *in* themselves, rather

than being different *from*. Multiplicities that are characterised by differences in kind offer a radical departure from the frameworks of identity within which a multiplicity is that of the One and the Multiple. In contrast to the homogenous and discontinuous nature of the One and the Multiple, multiplicities characterised by differences in kind are heterogeneous and continuous (Deleuze 1991:38). Such multiplicities are not comprised of quantifiable, discrete units, which are marked by an overarching homogenous sameness. Rather, they are composed of heterogeneous elements different in kind. The continuity of such multiplicities is not of the order of an enduring transcendent totality or unity, but rather reflects the continual mode of differing within such multiplicities. Differing in kind describes a movement whereby any change is not one of quantity, but of quality, a change in nature. Multiplicities composed of heterogeneous elements are continuous to the extent that those elements as different *in* themselves, rather than being different *from* each other, are traversed by a continual movement of differing. As opposed to discrete multiplicities, according to Boundas, continuous multiplicities are intensive magnitudes whose nature changes each time they are divided (1996:83). As Deleuze and Guattari write:

> An intensity, for example, is not composed of addable and displaceable magnitudes: a temperature is not the sum of two smaller temperatures, a speed is not the sum of two smaller speeds. Since each intensity is itself a difference, it divides according to an order in which each term of the division differs in nature from the other. (1987:483)

Any differing marks a change in nature or kind and intensive multiplicities are therefore heterogeneous, non-reducible proliferations of difference. Thus, two distinct types of multiplicities appear, the intensive and the extensive, each characterised by a contrasting mode of apprehending difference, one as difference in degree between self-identical units, the other as the continual movement of differing in kind.

If the elements of an assemblage are intensive multiplicities that intersect with other multiplicities, then each intersection will clearly produce other multiplicities that differ in nature from any of those preceding. As such, each element becomes something other with each new connection and within each assemblage. Thus, when referring to the elements or components of an assemblage, it must be remembered that these contents of assemblages, while they may achieve a degree of individuation, stability and endurance within an assemblage, are never essentially so. Rather, the components of an assemblage are multiplicities of flows, matter, particles, speeds and intensities which differ in kind with each new linkage. To the extent, then, that the components of an assemblage are not a set of self-identical entities, the meetings between components cannot be understood as a prosthetic encounter. Technology does not meet a body, rather the matters, flows, forces and intensities of the corporeal link and connect with other flows, forces, and materials of the technological and different bodily and technological multiplicities are elaborated. These are neither hybrids, nor variations: they differ in kind and cannot be traced back to, or decomposed into, original unified entities.

If the elements which compose assemblages are multiplicities, then clearly the movement of differing is central to any understanding of both an assemblage and its components. As such, the logic of identity and the framework of binary opposition is no longer adequate as a means to establish the status of any one element. For example, machine and nature can no longer be explained in binary terms where one is understood in terms of the other, machines being the lack or absence of nature. Rather, each is considered different in and of itself and thus the relation between the two is not

conceived in hierarchical terms. Both elements are equally operational in a productive mode. Within an assemblage the forces of each meet and affect each other, such that it is impossible to figure one as the diminution of the other, as privileged term. Grosz's description of assemblages clearly illustrates the incompatibility of the concept with the logic of identity:

> Assemblages are the provisional linkages of elements, fragments, flows, of disparate status and substance: ideas, things – human, animate, and inanimate radically different all have the same ontological status. (1994:167)

Where Grosz refers to the shared ontological status of the heterogeneous elements of an assemblage, she is not reinscribing an overarching transcendent sameness. Rather, she is noting the attempt by Deleuze and Guattari to move beyond an ontology grounded on, or elaborated through, identity. As part of their strategy to escape the conceptual horizon of identity, Deleuze and Guattari ask a different question from that of traditional metaphysics. They are not asking what things are, that is, attempting to explain being through divining the essential identity of an entity. Rather, to displace any ontological identity, they inquire what things *do*, that is, what productive capacities for connection and linkage, for differing, move things? What becomings do they enter into and how can this movement be thought as movement, rather than arrested and identified? They are, according to Grosz, concerned with thinking "a becoming beyond the logic, constraints and confines of being..."(1993:170). In line with the general focus of this thesis, I want to explore this shift in terms of frameworks of knowledge, rather than engage directly with metaphysical questions of being. In this register, the refusal to elaborate a field of ontological differences between beings based on their essential identities, while it seems like the ultimate act of unification and identification whereby all things are the same, is in fact a refusal of a mode of knowledge ordered by identity.

As we have seen, identity as a framework of knowledge proceeds through distinguishing the identity of a being or object, based on its difference from other things, an understanding that apprehends difference only in terms of sameness. In a move such as Deleuze and Guattari's, which posits an ontological sameness, the differences between things can no longer be the sole basis on which to determine distinct identities. In this manner, difference is no longer simply ordered by, and subordinated to, identity and it follows that some new means of apprehension must be found for it.

One of Deleuze and Guattari's key strategies for beginning this process is to reframe one of the central questions that drive the production of knowledge. They suggest that, when formulating concepts with which to inquire into the nature of a thing or phenomenon, one does not ask what *is* it, but what does it *do*:

> For ages people have used them [concepts] to determine what something is (its essence). We, though, are interested in the circumstances in which things happen: in what situations, where and when does a particular thing happen, how does it happen, and so on? A concept, as we see it, should express an event rather than an essence. (Deleuze. 1995:14)

In this manner, identity is not established from the very outset as the framing question, in response to which an essential identity is sought in unified, self-contained things. Rather, Deleuze and Guattari pursue the functional and productive connections and linkages through which things find local and specific articulation, the machines or assemblages to which they belong. The machine and the assemblage as *machinic* does not describe, for Deleuze and Guattari, a technological device or tool, but rather refers to a productive connection of elements. By directing our attention to the operations of such machines, we can begin to apprehend the forms and functions of a thing, or phenomenon:

> Given a certain effect, what machine is capable of producing it? And given a certain machine, what can it be used for? Can we possibly guess, for instance, what a knife rest is used for if all we are given is a geometrical description of it? (Deleuze & Guattari. 1983:3)

Thus the question of the form and function, status and substance of a component of the assemblage must be addressed through an examination of the linkages and connections between it and other elements. It is not to be found in the interior depths of the component itself. Identity is not necessarily excluded from such a model, but it does become peripheral: it is a by-product, which might appear within the operations of assembling. That is, identity might be produced and take on a particular formulation within an assemblage, but equally it might not. This, then, indicates a shift of epistemological framework, where identity no longer functions as the ordering framework, but rather is itself a product of historical circumstance.

To claim that assemblages are not grounded on a framework of identity is not however to claim an exemption for assemblages from the matrices of power/knowledge through which the logic of identity has proliferated and been active historically. However, it is to claim that the concept of assemblage is not elaborated through and cannot be grasped by the epistemological frameworks of identity. For Deleuze and Guattari to think social, material, and technical formations as assemblages requires an epistemological framework other than that of identity. It implies a mode of knowledge capable of apprehending difference as positive and autonomous; as difference in kind. In the second half of this chapter I want to pursue further Deleuze and Guattari's attempt to elaborate such a mode, through their notions of becoming and the virtual and actual. Such pursuits will take us some distance from the question of technologies and bodies.

However, they are directed towards mapping out a theoretical horizon within which we can put those question such that genuinely new and transformative responses might appear.

Difference and Becoming

If we understand assemblages as contingent arrangements of interpenetrating intensive multiplicities, then clearly, on Deleuze's conception of multiplicity, the components of such assemblages are characterised by a movement of differing, as they connect with other elements of the assemblage in the process of reaching a local articulation. Each connection marks a change in nature of the component multiplicity, whereby the components of an assemblage are continually differing as they make new connections with other components. This differing is not grounded on an original unity, whereby a local articulation can be explained as a mere variation of a pre-existent unified entity, since every differing is a change in nature. Thus, the components are not simply different from a prior arrangement, but also different in themselves. This movement of differing is also described by Deleuze and Guattari as becoming. Becoming is one of their concepts that has drawn a great deal of attention, particularly from feminist theorists interrogating the notion of becoming-woman.[4] While this debate continues to drive many feminist engagements with Deleuze and Guattari, it is not necessary to revisit it at this juncture. My interest in becoming is not concerned with the particular formations that Deleuze and Guattari explore in *A Thousand Plateaus*. Rather, I am interested in the mechanics of the concept itself, how it is formulated and how it intersects with the question of difference.

Grosz argues that becoming is a crucial concept in the elaboration of an alternative conceptual horizon: it not only marks a shift from the metaphysical project of elaborating Being, but is also an attempt to think an open-ended epistemological horizon, within which knowledge proceeds along lines other than those of identity (1993:170). She is interested in the conditions under which the emergence of the genuinely new might be thought other than through a framework that always already determines the future in relation to the past and present. For her, this requires a mode of apprehending the world, a mode of knowledge, that leaves the future open, that does not install a teleology through which the past and present always determine the future. She argues that it is necessary to develop a non-deterministic understanding of time in order to think the new (1999a:4). While her focus is on temporality in relation to becoming, she maintains that difference is crucial to opening up an indeterminate future in which the new might appear (1999b:19). Without even considering the question of time, we can see how rethinking difference is necessary to break with determinism. Unless difference can be thought or apprehended as difference in kind, the new remains a mere variation of existing formations, that is, thought only in terms of degree of difference from them, thus determined in relation to them rather than as of another order, radically new in and of itself. Thus, an open ended mode of knowledge must be able to acknowledge and accommodate difference, both between things and, more importantly, within things, that is, in their capacity to become something entirely different in nature. This movement of differing, whereby a thing differs in kind from itself, is the movement of becoming. Clearly, to the extent that difference is only understood within the logic of identity in terms of degree, or variation from a stable unity, a framework of knowledge based on identity will be unable to account for becoming.

As we have seen, the discourses of transformation in cyberspace remain fundamentally limited because they cannot escape the epistemological horizon of identity. Any transformative possibilities they articulate are always in the last instance recuperated in the oppressive structures of binarism, which characterise identity and which obliterate difference in kind. Moreover, as long as feminist transformative projects remain articulated within that horizon, they will be unable to elaborate any genuinely new or transformed articulation of sexual difference. Thus Grosz, in raising the question of the new, is not just retheorizing time, but indicating the necessity of a shift in conceptual frameworks in order to open up a field of transformation. I have been claiming that a Deleuzian concept of assemblage offers a way to think the intersections of bodies and technologies that opens possibilities of transformation based on effecting a shift from the determining logic of identity. In the next section, I want to look more closely at how concrete everyday assemblages can be situated within a conceptual horizon of becoming, at how difference is plugged into assemblages at a constitutive level. In this way, it will be possible to demonstrate how the concept of assemblage is indeed open ended and thus a potentially useful tool for feminists in terms of pursuing transformation. Deleuze and Guattari's formulation of the virtual and the actual presents one approach to these questions and, I would argue, offers a means of thinking how difference in kind might be apprehended by knowledge, in other words, how we might comprehend the difference, or the movement of becoming, in everyday objects such as bodies and technologies.

The Virtual and the Actual

The virtual and the actual are central to any understanding of the movement of differing and the process of becoming, in so far as they offer an explanatory framework within

which to account for the apparent solidity, functionality and endurance of objects and forms, while retaining the movement of differing. In this manner, the functional and tangible operations of assemblages can be explained other than as the aggregation of stable, self-identical, pre-existent elements. The virtual, in Deleuze and Guattari, has an entirely different status from that in common use in the discourses of cyberspace. The formulation of the virtual in discourses of cyberspace is articulated through the matrix of identity, in which the virtual is thought in terms of difference of degree from the actual. Thus, in the instance of the virtual body, it is a body that exists in a relation of divergence from the 'real life' actual body. Deleuze and Guattari propose another understanding of the virtual, characterised by differences in kind. In such a formulation the virtual does not exist in a relation of difference *from* the actual, but rather is itself of another order to the actual, not an imitation or representation of it, but possessed of its own reality. If both actual and virtual are considered to be possessed of their own reality, then another commonplace conception, of the virtual as the possible and the actual as the real, is problematised. Within such a model the virtual is a pool of possibilities some of which will achieve realisation or actuality.

Boundas explains that to think the virtual simply in terms of a field of possibilities is incompatible with Deleuze and Guattari's project, in so far as it, not only restricts the horizon of the real, but also locates the entire configuration within a logic of identity:

> The possible must be realised, and the process of its realisation is subject to two essential rules, resemblance and limitation. The real is supposed to be in the image of the possible that it realises. The possible resembles and represents the real. As for the limitation which affects the relation between the possible and the real, it is as if the real were that which survives the abortion of the many possibles. (1996:86)

The notion of the virtual body in cyberspace offers a clear example of framing the virtual only as the possible; and of the operation of rules of resemblance and limitation that govern this relation. The real body in cyberspace scenarios is considered as a severely limited set of restrictive possibles, while the virtual body is thought to be a manifestation of other possibilities that have not been realised. In this way, the real is understood as a limitation, the virtual as the possible, in the sense Boundas describes, wherein the virtual is the realm of unlimited possibility, the real a circumscribed field of these. We can also see resemblance at work in the 'virtual body' scenarios of cyberspace. As we saw in chapter four, for the pundits of virtual reality, the less the virtual body resembles the real body, the more liberating it is. However, the relation of resemblance still functions as an ordering principle. Real bodies are considered representative of certain (restrictive) possibilities, as opposed to other more liberating ones. The real body results from a restriction of possibilities, but its relation to those restricted possibilities is one of resemblance. Thus, while advocating a virtual body that does not resemble the real body, as an avenue for transformation, the real remains understood in terms of resemblance or as the concrete representation of particular possibilities that have achieved realisation.

The problem with this model of virtual and actual parsed as possible and real is that it is a closed system within which the real is strictly limited. Produced by way of a limitation of the possible, the real is presumed to be a subset of the possible, whereby the real is a taking up, or realisation, of a limited number of the elements of the possible. The possible then is presumed to pre-exist the real, as the reservoir from which it proceeds. Thus, both as resemblance and limitation, the real becomes a restricted field, with no horizon beyond the limited set of the possible it realises. Moreover, such a

model turns on the logic of identity as in resembling the possible the real differs only in degree from it. Thus, as Grosz points out, this model of realisation effectively precludes any possibility of creativity and novelty within the real, since the real subsists only as a subset of the possible (1999b:26). Such a figuring of the virtual, in terms of a complete set of possibilities some of which are realised and some of which remain possible, is premised on the understanding that the virtual is not real, that it is awaiting 'realisation' through which it becomes real. In contrast Deleuze understands the virtual to be possessed of its own reality:

> The virtual on the other hand, does not have to be realised, but rather actualised; and the rules of actualisation are not those of resemblance and limitation, but those of difference or divergence and of creation. (1991:97)

Clearly, Deleuze and Guattari propose a very different understanding of the virtual and the actual and the relation between them, which cannot be assimilated into a general framework of the possible and the real. Like most of their concepts, the virtual has multiple resonances and deployments. Here I want to examine just one instance where they elaborate the operations of the virtual and the actual, that of chaos and the void as discussed in *What is Philosophy?* It must be remembered that this is only one of a range of modes and contexts within which they conceptualise virtuality. Through examining this particular configuration of chaos, void, virtual, I hope both to sketch out a general conception of the virtual and the processes and modes of actualisation, and to link them into the earlier discussion of assemblages and difference. This line of exploration strikes me as apt, in so far as it resonates with contemporary scientific discourses on the nature of being, which also fuel cyber-transformative scenarios. It also opens onto the broader question of Deleuze and Guattari's strategies for thinking difference as

positivity, rather than as negation, lack or absence which are equally central to this project.

Chaos

In *What is Philosophy?*, Deleuze and Guattari explore the ways in which various modes of knowledge, specifically science, philosophy and art, encounter and apprehend chaos. They suggest that chaos can be thought as virtual:

> Chaos is defined not so much by its disorder as by the infinite speed with which every form taking shape in it vanishes. It is a void that is not a nothingness but a virtual, containing all possible particles and drawing out all possible forms which spring up only to disappear immediately, without consistency or reference, without consequence. (1994:118)

Chaos is characterised by Deleuze and Guattari as different in kind from order, neither prior to order nor the result of a breakdown of order. It is not simply a state of dis-order. Rather, Deleuze and Guattari refer to it as a void, in a particular sense other than that of the absence of all things and the absence of order. The void of chaos can be thought as a void in the sense of a domain or zone, within which self-identical, stable, consistent forms or objects cannot exist. However, for Deleuze and Guattari, this absence of 'things' does not mark the void as an absolute negativity, a pure absence or lack, an "infinite nothingness" (118). If the void of chaos is marked by the impossibility of durable forms or objects, it can nevertheless be characterised as a realm of positivity. The void is 'filled' with limitless, infinite no 'things', or non 'things', that is, matter, particles, intensities, immaterial forces not congealed into identifiable thinghood. This no'thing'ness of the void of chaos is the dis-aggregation, dis-integration of things and the proliferation of non-things. While such nothingness clearly cannot be understood as lack or absence, it is equally problematic to posit it as totality of presence, or meta-

presence, that is, the presence of all possible things. The presence of the void is not that of a totality of self-present identity, but rather the positive movement of difference in kind.

For Deleuze and Guattari, chaos is a nothingness that can be thought as a no'thingness', that is, a state "containing all possible particles and drawing out all possible forms" (118). Here presence is not understood as one side of a presence/absence dualism, but rather in terms of proliferating multiplicities. Within the void multiplicities – that is configurations of matter, intensities and forms – are continually arising and dispersing. To think the void of chaos as virtual is thus to think its modality and its consistency. To think the virtual not in terms of its contents, or lack thereof, but rather as a mode of appearance and movement of speed, avoids thinking it through the framework of difference in degree, in which chaos is an extreme degree of disorder in relation to order. In this manner, chaos can be thought, not in terms of the absence of order or as a reservoir of possible entities and objects awaiting order, but rather as different in kind to order and possessed of its own reality. Thus, the void of chaos cannot be framed simply as a set of possibilities for order to realise, nor the virtual understood in general as the possible.

Apprehending the Void

If the virtual in not simply the possible, then actual entities or objects cannot be understood as realisations that resemble their virtual counterparts. Thus, it is not possible to describe or account for the virtual in terms of it containing virtual 'things'. This is apparent in Deleuze and Guattari's consideration of the virtuality of the void of chaos, where 'things' cannot be identified in the speeding into and out of appearance. There are no virtual 'things' and the virtual is of another order than a mere repository of

possible things. The virtual as chaotic void is not, then, a reservoir available for 'realising' some of its various contents, that is, its possibilities. According to Deleuze and Guattari, it is rather a mode of intensity and differing. Actualisation cannot be understood as the solidifying of particular virtual 'things', in a relation of resemblance, since no such 'things' endure in the void of chaos. In order to understand how actualisation might apprehend the virtuality of the void, Deleuze and Guattari examine the modes of apprehending virtuality (as chaotic void) elaborated by science and philosophy.[5] They find distinct modes and figures of knowledge in each, the functive in science, the concept in philosophy, and trace the operations of both in terms of how they intersect with the void of chaos, its virtuality, in order to reflect on the status of the actual. The process of actualisation and the status of actual things, as understood by both science and philosophy, can be discerned by examining how each understands and apprehends the virtual.

The general terms science and philosophy have very specific nuances in this instance which will become apparent as we move through Deleuze and Guattari's account.[6] While Deleuze and Guattari acknowledge many points of intersection between science and philosophy, these demonstrate very different modes of knowledge, nonetheless, in their respective apprehensions of the virtual:

> Now philosophy wants to know how to retain infinite speeds while gaining consistency, by *giving the virtual a consistency specific to it* ... Science approaches chaos in a completely different almost opposite way: it relinquishes the infinite, infinite speed, in order to gain *a reference able to actualise the virtual.* (118)

For Deleuze and Guattari, the encounter with the speed of vanishing is central to understanding how science and philosophy formulate their objects and modes of

knowledge in relation to chaos. In setting the speed of vanishing and appearance as the defining mode of chaos, Deleuze and Guattari are able to insist that the void of chaos is possessed of virtuality rather than being a reservoir of possibility. The void of chaos is not the sum total of possible 'things'; rather forms and substances speed into fleeting 'thingness' in the movement of appearance and vanishing in the void of chaos. This movement marks the impossibility of stable forms within the virtual and, thus, renders untenable any notion of the virtual as the site of possibilities that might be identified and bear a resemblance to realised forms. Speed as the defining mode of chaos establishes difference and the movement of differing as characteristic of chaos as virtual. The speed of vanishing renders durable identity impossible in a field of ceaselessly differing and proliferating multiplicities. No form is ever the same as itself at any moment, but is always being vanished or reformulated in the movement of chaos of the void. It is always differing from itself at any moment. Thus, while the speed of contact and dispersal, appearance and vanishing within the void might give rise to momentary configurations, they cannot be identified as stable enduring 'things'. The speed of vanishing in chaos is a movement of differing in kind. Deleuze and Guattari contend that science and philosophy apprehend this movement in different ways: science slows it down in order to actualise the virtual; philosophy attempts to discern a consistency within it.

Science – Slowing Down

Science, Deleuze and Guattari claim, actualises the virtual. It is a mode of knowledge directed toward explaining forms, elements, objects, forces and intensities in terms that stabilise and delimit them. Science identifies such things through establishing a grid of reference that elaborates relatively stable objects of knowledge. Philosophy, on the

other hand, attempts to discern the virtuality of events that traverse all such stable formations. Deleuze and Guattari are not dismissing science out of hand as a labor of identification and conservatism: they are equally interested in its creative impulses and its necessary (and for them productive) proximity to chaos (206). They contend that science, as a mode of knowledge, or as a series of practices of knowledge, proceeds by referencing the virtual in a manner that gives rise to an actual. This is not to say that everything which is actual is inevitably contained within a framework of identity. On the contrary in exploring the connection of philosophical concepts with scientific objects of knowledge, Deleuze and Guattari are investigating the conditions under which the actual can be understood to be of the order of difference. I will return to this question, but first want to make something of a detour through the operations of the function.

In the operation of scientific reason and method, Deleuze and Guattari see the movement of actualisation, an attempt to stabilise, to draw forms and configurations from the void and establish them as disconnected from the chaotic flux and possessed of a durable internal coherence. They conclude that science achieves this through elaborating a grid or 'plane' of reference, which functions as an epistemological structure that apprehends the incessant differing of chaos in such a way as to bring into appearance identifiable forms and configurations. Deleuze and Guattari describe these forms as states of affairs, things and bodies. Each is characterised by different combinations of referenced points, but each is apprehended only through the elaboration of a frame of reference that arrests, or sets a limit to, the movement of differing – the speed of vanishing – of the void. According to Deleuze and Guattari, this field of

reference can be established only once the speeding into and out of appearance is slowed down or freeze-framed (118).

This slowing down is accomplished through the creation and deployment of functions or scientific propositions. Functions, or propositions, are the working units of science, through which it grasps and explains phenomena. For example, Newton's second law which states that when force is applied to mass it causes an acceleration is expressed in the function $a = f/m$ (Gribbin. 1999:16). This function offers a universal explanation of the speed of matter and sets out a field of relations that captures all speeds as accelerations determinable by the relation between force and mass. Functives are the operational elements or components of functions, in this instance acceleration, force and mass. Deleuze and Guattari see that the two most important types of functives for apprehending chaos and giving rise to reference, are the limit and the variable (1994:118/9). The operations of these functives effectively slows down the speeds of vanishing of chaos and, in doing so, actualise the virtuality of the void.

> To slow down is to set a limit on chaos to which all speeds are subject, so they form a variable determined as abscissa, at the same time as the limit forms a universal constant that cannot be gone beyond. (118)

Such constants in science as absolute zero, the speed of light, or a maximum degree of contraction, constitute limits (118). This limit not only sets a boundary on the infinite, a maximum, but also establishes a point in relation to which variables are articulated in their variation. A scientific function or proposition might describe the range of possible behaviours of variables such as energy, motion or mass in relation to an invariable constant. The variable varies in relation to the constant and, thus, the range and scope of its variations are both delimited and measurable by that relation. It is this relation,

between constant as limit and variables as a mode of apprehending a range of attenuations of elements, that composes a grid of reference. If the speeding of chaos is apprehended in relation to a limit or constant, its movements are no longer infinite but become a series of variable states of slowness or specific speeds, which can be discerned and charted (referred) in relation to degree of divergence or distance from the constant. In this way a speed, can be apprehended at a point, that is, arrested, measured, freeze-framed. Thus, such constants as absolute zero or the speed of light work to set a limit on infinity by establishing a point of reference in relation to which all speeds becomes variations, and thus referencable. Deleuze and Guattari see that there are many planes of reference, each with different limits and different variables, all functioning along the same lines to slow down the speed of vanishing of chaos. In this manner, the virtuality of the void, that is, the movement of differing, is apprehended in actual forms, particles, and forces:

> A particle will have a position, an energy, a mass and a spin value but on condition that it receives a physical existence of actuality, or that it "touches" down in trajectories that can be grasped by systems of coordinates. (119)

Thus, a particle must be extracted from the infinite vanishing of the void and grasped by 'thingness', the solidity of an actual, articulated through a field of reference, elaborated through the operations of functions.

For science, working with functions to establish fields of reference, in order to grasp the actual from chaos, the void as virtual is only ever apprehended through the lens of the actual. According to Deleuze and Guattari, the actual that science elaborates consists of states of affairs, bodies and things which are composed of mixtures of elements distributed into various arrangements of co-ordinates or grids of reference. As mixtures

and arrangements, states of affairs, bodies and things might be described as assemblages. This raises the immediate question as to whether the epistemological framework of reference operational in science forecloses such actual assembled formations from the movement of differing of the virtual, and thus, shuts down becoming. Where actualisation, in science, proceeds through the arresting of the incessant movement of appearance and vanishing of chaos, it seems to affect a limitation of the proliferation of differing and becoming of the void which for Deleuze and Guattari mark its virtuality. However, as Grosz points out, the actual is not simply a section extracted from the virtual, but is itself different in kind from the virtual (1999b:27). What is actual is no longer virtual. This does not necessarily mean, however, that the actual is automatically restricted to an economy of identity devoid of difference in kind.

Grosz claims that, for Deleuze and Guattari, while it might no longer be subject to the instantaneous movement of differing of the chaotic void, the actual arises through a process of creative differentiation and divergence from the virtual, therefore, actualisation proceeds through a movement of difference (27/28). Even conventional science, which, according to Deleuze and Guattari, uses functions to install grids of reference, in order to be able to explain or apprehend such states of affairs and bodies, does not erase the process of actualisation as a fundamental process of differentiation:

> actual terms never resemble the singularities they incarnate. In this sense actualisation or differenciation is always a genuine creation. (1994:212)

If science proceeds on the basis of a movement of difference, although appearing to elaborate identified and unified objects and forces, Deleuze and Guattari are interested

in tracing this movement in order to discern the difference within actual states of affairs, bodies and things. They contend that actual states of affairs, bodies and things remain in some manner connected with the virtual: "the most closed system still has a thread that rises towards the virtual, and down which the spider descends" (122). They see philosophy as offering the means to trace this thread. Moreover, in doing so, philosophy is able to think actual states of affairs, bodies and things, other than through the framework of identity. In devising a means to explain actual things other than in terms of their essential internal being or depth, but through their relation to the movements of differing and becoming actual of the virtual, Deleuze and Guattari raise the possibility of thinking an actual that does not necessarily shut down difference. They propose the concept as philosophy's strategic tool for this task.[7]

Conceptualising Difference

While science and philosophy take opposing paths for Deleuze and Guattari, they remain linked in so far as they both take events as the basis for their enterprise:

> It could be said that science and philosophy take opposed paths, because the philosophical concepts have events for consistency whereas scientific functions have states of affairs, or mixtures for reference; through concepts, philosophy continually extracts a consistent event from the state of affairs - a smile without the cat, as it were - whereas through functions, science continually actualises the event in a state of affairs, thing, or body that can be referred to. (126)

It is the event that is actualised in a state of affairs, but it is also the event that remains virtual. As Grosz explains, the actual never resembles the virtual, but rather is produced through a mode of differentiation from the virtual (1999b:27). Deleuze and Guattari describe this process of differentiation, as it is carried out in science, in the setting out of a plane of reference, which distinguishes states of affairs, bodies and things through

referencing a chaotic virtual. Because these 'things' are not identifiable in the flux of chaos, they appear through a movement of differentiation from chaos enacted by referencing. Thus, an event is apprehended and actualised into a state of affairs, body or thing, but this process by no means exhausts or fully accounts for it *as an event*. For Deleuze and Guattari, it is the concept in philosophy that can apprehend an event, as event.

Like most Deleuzian terms, the event is multivalent and used interchangeably with other terms: in this instance assemblage, concept and event are all intertwined. In discussion with Claire Parnet, Deleuze explains the event in terms of a battle. The event of battle is actualised in the clashing of bodies and weapons in the fray, but the battle itself not contained within these colliding bodies. Rather, Deleuze describes it as an "impassive, incorporeal, impenetrable battle, which towers over its own accomplishment and dominates its effectuation" (Deleuze & Parnet 1987:64). The event remains to a degree exterior to its actualisation: in the instance of battle, the event is actualised in the battling of bodies, but *as event* the battle itself is elsewhere. It is more than simply the clashings, woundings and killings of bodies:

> This is what we call the event, or the part that eludes its own actualisation in everything that happens. The event is not the state of affairs. It is actualised in a state of affairs ... but it has a shadowy and secret part that is continually subtracted from or added to its actualisation; in contrast with the state of affairs, it neither begins nor ends but has gained or kept the infinite movement which gives it consistency. (Deleuze & Guattari 1994:156)

The event is the thread that rises toward the virtual and, for Deleuze and Guattari, the concept offers a means to trace the event. They claim that the concept is of another order to the function or proposition as it does not operate through elaborating a plane of

reference in order to actualise. It too encounters and works the virtual, but in a very different way, which does not attempt to freeze-frame the movement of differing, of appearing and vanishing, within the chaos that marks the chaotic void as virtual, but rather "expresses an event that gives consistency to the virtual on a plane of immanence and in an ordered form" (133).

Concepts operate, according to Deleuze and Guattari, by diagramming or cutting planes of consistency across the void. Planes of consistency do not function to elaborate stable forms, entities or points of reference. Rather, they operate by distinguishing a proximity of particular intensities, flows of particles, forms, configurations and forces, and so elaborate the 'events' which such a conjunction of those elements constitutes. Deleuze and Guattari give the example of a concept of colour articulated as a consistency:

> Goethe constructs an imposing concept of colour, with inseparable variations of light and shade, zones of indiscernability, and processes of intensification ... whereas Newton constructed the function of independent variables or frequency. (1987:161/2)

Thus colour can be actualised through a system of co-ordinates that sets out the variable frequencies of light waves, or it can be conceptualised in the manner of Goethe, which maps out a field of elements that belong to it, through which it traverses as an event, or consistency.

Concepts, then, are not concerned with identifying 'things', but with following the trajectories of intensities, movements, fluxes, and tracing the lines of consistency that bring them to a proximity. As collections of heterogeneous components, concepts are multiplicities or micro-assemblages. The elements that compose a concept coalesce into

the concept, not through a process of addition, but through a coming to proximity in achieving a particular and shared consistency. To return to the example of the battle, the concept of battle traverses such heterogeneous elements as the force of metal meeting the force of flesh, the speed of projectiles, the forces of bodies meeting the forces of other bodies, and so on. When these meetings of force achieve a particular consistency, that is, occur on a particular scale (one body clashing with other might be sport or sex – a different level of intensity is required to become battle), with a particular intensity, the event of battle appears and a concept of battle can survey those elements and thus apprehend the event as battle. Where the concept traces events it must be able to account for the particular composition of events, the heterogeneity of components and the particular consistency that marks their appearance as events. Concepts are not events, however, because their mode of operation is capable of apprehending the event in a manner that does not actualise it by referencing:

> The concept is defined by the *inseparability of a finite number of heterogeneous components traversed by a point of absolute survey at infinite speed.* (Deleuze & Guattari 1994:21)

A concept is not simply the mere congregation of components, but is formulated through the particular mode in which those elements are brought into relation with each other. In the concept this mode is designated by Deleuze and Guattari as the "point of absolute survey at infinite speed" (21). Speed is understood in a more specific register here, though it does resonate strongly with the movement of vanishing of the void of chaos, as it is a continuous and infinite movement. In the case of the concept, infinite speed characterises the instantaneous and simultaneous 'survey' of its components. The concept is contemporaneously present across all its components elements. For Deleuze and Guattari, this survey is not a progression, whereby all the components of a concept

are brought under its umbrella as a survey encounters them one after another, in a cumulative process of adding one element to another so as to compose a concept. That is, the survey is not an accounting for the components. The survey of a concept operates as the interpolation of the concept into each element, such that they remain heterogeneous singularities, but are infused with the concept. Thus, the battle ranges across the multiple encounters of forces between bodies, metals, terrains, each of which retains its heterogeneous status, but is equally infused with battle. Because it proceeds by survey, the concept is more akin to an event than a structure. The concept is not an overarching whole, or ordering unity, into which component parts are integrated. Rather, the concept is immanent. It spans the component elements, not externally as a structure, but rather by being co-present within the elements. So the bodies, equipment, cuttings and woundings of battle are not designated battle because they are arranged within an overarching 'battle' structure. Rather, once they achieve a particular intensity and consistency, the event of battle appears, which the concept of battle can map. Concepts do not represent events, nor do they elaborate a field of reference to account for the elements traversed by events. Rather, they track the consistencies that characterise an event through the various heterogeneous component elements.

The relation between concepts and events entails a particular encounter with the virtual. In so far as events bring together a collection of elements in the actual, but are not themselves entirely actualised in those elements, they retain an aspect of virtuality. In charting the movement of the event, the consistencies that bind the component elements together, the concept finds a consistency in the virtual. To return to the example of chaos, according to Deleuze and Guattari, concepts give rise to planes of immanence (or consistency) within the void of chaos. These planes are still virtual, but they have

gained a consistency. From the void of chaos, planes of immanence appear when concepts diagram the itineraries of events beyond the actual. We saw that events are both immanent and consistent and that the concept, in apprehending events, elaborates a virtual, which, while still virtual, has gained consistency. For example, Manuel de Landa, in his exploration of the coincidences between Deleuze and Guattari and the modern sciences of far-from-equilibrium systems, chaos and self-organisation, demonstrates this virtual consistency even in simple processes such as the formation of soap bubbles. He explains that the chaotic flux of soap molecules achieves a consistency when they approach what he describes as an attractor, which in the instance of soap molecules is the action of seeking the point of lowest tension (1999:33). At this point, the formerly chaotic molecules approach an endogenous topological point and become spherical bubbles. The topological point is not a structure into which they become integrated, but it takes a different form for different material: salt molecules seeking the point of lowest tension, that is, approaching the same attractor as soap, will find a crystalline form, a cube (33/4). Thus the virtual gains a consistency as topological point, which is immanent to the sphere (and cube) but not contained within it. The sphere arises through the actualising of an event of seeking lowest surface tension (bubbling) and the virtual becomes consistent as topological point only in relation to the sphere that has actualised it.

In the case of chaos, science and philosophy, the virtuality of chaos takes on a particular consistency once it is in a relation with the mode of actualisation of science. That is, in the process of actualising an event, a different mode of virtuality is elaborated. This is not to say that the actual causes the virtual, nor is it a question of precedence, in which there must first be the work of actualising in order for a particular type of virtuality to

appear. Rather, if science references chaos in a process of actualising, this process also gives rise to a certain becoming consistent of chaos as a virtual traversed by events and mappable by concepts. Thus, the flux of differing of chaos becomes a virtual, which does not shut down the movement of differing, but finds a consistency that allows the temporary formation of conglomerations of elements, including the materials, intensities and forces that compose events and which concepts would diagram. The relation between the virtual and the actual remains one of differentiation and not resemblance. As such, the event has another relation with chaos that is not simply a retracing back from the actual to the chaotic void from which referencing extracted it:

> Now, if we go back up in the opposite direction, from states of affairs to the virtual, the line is not the same because it is not the same virtual (we can therefore go down it as well without it merging with the previous line). The virtual is no longer the chaotic virtuality but rather virtuality that has become consistent, that has become an entity formed on a plane of immanence that sections the chaos. This is what we call the Event, or the part that eludes its own actualisation in everything that happens. (Deleuze & Guattari 1994:156)

The plane of immanence is, then, the mode or zone where concepts trace across the surfaces and through the flows of chaos. It is a mode of apprehension that preserves the movement of differing and allows an understanding of the event as the operation of differing, which intersects with actualised states of affairs, things and bodies. To the extent that an event traverses them but also to a degree escapes them, actual states of affairs, bodies and things can never be thought as entirely solid or fixed. Concepts find in the congealed and coordinated formations of the actual a trace of the movements of differing, the link to virtuality that remains in force but which has been largely shut down by reference. Thus, the purpose for philosophy in seeking or creating concepts is not directed at defining or uncovering an essential identity in an actual object, entity or

form, but at tracing its event, of diagramming the lines of becoming and creativity, its relation to the virtual.

While the actual becomes actual through a process of differentiation that extracts the virtual from it, to the extent that it is also the actualisation of an event it never entirely accounts for, and which retains the consistency and movement of a virtual, the actual itself is never entirely quarantined from virtuality. The actual can thus be thought as part of a process of differing, of becoming. Even if the actual has no virtuality, it cannot be thought except in relation to a virtual. Moreover, if a means of thinking this virtual, and its relation to the actual, is available other than that of reference and identity, then although the actual might arrive by reference, it can be apprehended other than through reference. This is, of course, the work of the concept. In this manner the actual can be thought as to some degree open ended. Thus, while the concept is incorporeal and abstract, in following the itinerary of the event through the configurations of materiality in states of affairs, things and bodies, it pursues the moments of differing that constitute them as multiplicities. As such, concepts offer a means to apprehend states of affairs, bodies and things other than through a framework of identity, that is, in terms of their heterogeneity, difference and becoming.

The concept and the event can be understood as multiplicities, that is, assemblages of heterogeneous components linked, not in a prosthetic mode of 1 + 1, but through the achievement of a consistency and in a relation of immanence, not transcendence. As such, they are characterised by difference in kind. This is apparent if we consider them in terms of their intersection with chaos as virtual, where the concept and the event retain the movement of differing of chaos. Difference is equally apparent in their

internal constitution and functioning: the heterogeneity of component elements, the endogenous, immanent nature of the event and the survey of the concept. Concrete assemblages, no matter on what scale, share these characteristics. That is, they are conglomerations of heterogeneous elements, which become functional in the achievement of a threshold of consistency, which does not alter the irreducible difference of the component elements, but does put them into a temporarily meta-stable relation with each other and fixes them contingently. Concrete assemblages are actual, but they are also actualisation's of events that, as we have seen, remain in part elsewhere. In this manner, we can explain the stability and durability of the elements of an assemblage, their concrete function and form. But, to the extent that they are actualisation's of events, those elements and the assemblage as a whole can also be understood to be marked by the difference and the movement of becoming. Thus, assemblages have consistency and durability, but they also have differing and mutation. This marks a key conceptual shift, which Deleuze and Guattari's concept of assemblage makes, and which I would claim offers a means to apprehend 'things' other than through an essential Being elaborated as identity. It offers a means to think things in terms of their difference, their becoming. That is, to the extent that 'things' arrive at actuality through a movement of differentiation, they cannot be thought in terms of self-identical essence. Moreover, in so far as they remain traversed by events, they are never wholly or finally fixed and shut off from other becomings.

Virtual Bodies – Concrete Assemblages

How, then, might such a complex, abstract and elusive set of concepts be brought to bear on feminist attempts to grapple with the transformational prospects of cyberspace? I began my exploration of Deleuze and Guattari's various concepts with the claim that

they elaborate a conceptual horizon within which feminists might pursue analyses of cyberspace that are not automatically recapitulated into the problematic logic of identity. I have argued, following Grosz, that genuine transformational prospects might thus appear. In concluding, I want to return to the consideration of bodies with which this chapter began, in order to outline the scope and nature of the conceptual shift Deleuze and Guattari's concepts and strategies offer. Bodies have provided a focus for assessing how different frameworks of knowledge apprehend difference in kind, so a re-examination of bodies will provide some preliminary indication of the usefulness of this shift.

I would argue that the first benefit for feminists, in taking up a Deleuzian approach, is that it offers a means of apprehending bodies other than in terms of identity, that is, other than through a binaristic relation of mind/body, culture/nature, information/matter. We have seen that thinking bodies as assemblages means thinking them as intensive multiplicities, characterised by the movement of difference in kind. Bodies, then, are not articulated within an assemblage as different *from* other elements in the assemblage, but rather, as multiplicities they are singular and specific, different *in* themselves. As concrete assemblages and components of concrete assemblages, bodies take on a contingent stability of form and function. However, this stability is always open to change and the movement of difference, in so far as the coming to pass of new linkages, new exchanges of force, effects a change in kind of the assemblage – so that a new assemblage appears.

In a second register, bodies as concrete assemblages and components of other assemblages are actual. However, as we saw, the actual is traversed by events that

retain an aspect of virtuality, which too is characterised by the movement of differing in kind. The event as virtual is always implicated in configurations and forms that might be actualised through a slowing down and stabilising of the movement, but which nonetheless remain tied to it. Thus, a discrete and stable body may be discernible, but it is never self-identical as it arrives through a process of actualisation which is a differentiation, and is always in commerce with the virtual, the movements of becoming, of speed, of differing. This suggests that implicit in any actual body is also the movement of differing and becoming through which other bodies might be actualised. This understanding of a 'virtual body' is clearly of a different order to the virtual bodies of virtual reality technology or the internet. As opposed to a computer-generated representation that represents an actual body in another medium, in this instance information space, a virtual body here could be understood as the virtual aspect of all bodies, that is, the thread which runs from any and every actual body towards the virtual, and the potential for new connections and new events which precipitate new actualisation's. Thus, a virtual body is not an identifiable or stable entity in itself, which can be apprehended via technological means, and which is a variation on the actual body. A virtual body is marked by the movement of differing, the events through which multiple bodies proliferate and dissolve. This is not a purely immaterial process: on the contrary, as we have seen, to the extent that it is both actualised and remains virtual, an event is as much a configuration of matter as of intensities, forces and immaterial flows.

Adopting an explanatory framework that can apprehend difference as difference in kind, rather than one directed toward elaborating identity, does not automatically dissolve everyday hierarchical relations and operational binary dichotomies. Nor, as Deleuze and Guattari would be the first to admit, does understanding various assemblages in terms of

difference and becoming render them immediately liberating and transformative. This is because everyday assemblages do not occupy a zone outside of the matrices of power relations. Knowledge/power formations are as active in assemblages as they are in structures. However, in taking a Deleuzian approach, the status of these formations alters such that transformation, while not automatic, is at the very least possible. Epistemological structures and relations of power are, according to Deleuze and Guattari, immanent to the assemblage, rather than transcendent structuring principles. The operations of power and knowledge can be diagrammed, in terms of how they are articulated within a particular assemblage and how in the encounters of other elements of an assemblage, particular arrangements and configurations and not others might appear. In the next chapter, I will examine in greater detail the internal mechanics of assemblages, through which relations of power and regimes of signs intersect with the matters, forces and flows that comprise the assemblage. At this juncture, it is important simply to note that all such meetings take place in a relation of immanence, which, in refusing to position power and/or knowledge as a transcendent ground, avoids establishing a deterministic framework and thus allows the possibility for transformation.

Deleuze and Guattari offer a conceptual horizon in which bodies can be understood as neither fixed nor given, but as particular historical configurations of the material and immaterial, captured and articulated through various assemblages, which to some extent determine them as particular bodies, but never manage entirely to exclude the movement of differing and the possibility of becoming otherwise. It is within assemblages that those becomings are actualised. And it is within assemblages that the forces and materials of bodies meet those of technologies, amongst other elements. In the next

chapter, I undertake a mapping of a cyberspace assemblage in order to explore how bodies in cyberspace might be apprehended, as well as to demonstrate how pursuing analysis within a Deleuze and Guattarian conceptual horizon results in a very different understanding of cyberspace phenomenon, one which proceeds on a different basis to that of identity and is thus more useful for feminists.

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[1] 'Assemblage' is the translation of 'Agencement' used by Brian Massumi in *A Thousand Plateaus*. Hugh Tomlinson and Barbara Habberjam follow this in their translation of Deleuze and Parnet's *Dialogues*. They remark in their Translators Introduction that "the French word has both an active and passive sense, 'a way of assembling or arranging' as well as the resulting 'ordering or arrangement' (1987:xii/xiii)."

[2] Ian Buchanan in *The Problem of the Body in Deleuze and Guattari, Or, What Can a Body Do?* describes this difference in approach as "an attempt to replace aetiology (a cause and effect) with ethology (action and effect), Freud with Spinoza" (1997:74). This shift, Buchanan sees, is indicative of the broader conceptual shifts which Deleuze and Guattari elaborate in a "move away from organisms to machines predicated by a prioritization of relations and qualities over terms and quantities" (80). It is in this sense that the assemblage is understood as machinic.

[3] Colebrook and Bray go on to argue that any model of embodiment which posits or presumes a pre-discursive, or pre-socially inscribed body is one which is articulated through a framework of representation which is inimical to Deleuze and Guattari's understanding of bodies. They argue that as long as a subjective account of thought is operational then representation will retain its conceptual primacy (1998:55). They see that Deleuze's anti-subjective approach shifts thought, and with it representation, to a position of immanence with the actions and matters of bodies and, as such, offers an account of embodiment which avoids the conceptual hierarchy which representation marks and, thus, allows them to be thought as difference:

> bodies, consciousness, actions, events, signs and entities are specific intensities each with its own modality and difference. They do not need their "difference from" each other in order to be (conceptual difference); in their specific singular being are positively different. (56)

[4] Dorothea Olkowski provides a comprehensive account of this debate in contemporary feminism in *Gilles Deleuze and the Ruin of Representation*. (1999) pages 32 - 58.

[5] Deleuze and Guattari also consider the way in which art apprehends chaos, however due to space limitations I will restrict my consideration to science and philosophy as they provide ample material for demonstrating the key points about virtuality and the processes of actualisation which I am attempting to make.

[6] Deleuze and Guattari use the term science here to refer both to particular disciplines within science, such as physics, Euclidean geometry and chemistry, and so on, but also to the generalised operation of scientific experimental method. They concede that new sciences such as the study of non-equilibrium systems, self-organisation, quantum physics, thermodynamics and so on do not follow the pattern which they are basing their analysis on. Indeed they find these branches of science much more attuned to their philosophical project. See *A Thousand Plateaus* (1987) pp 369 - 374 for a discussion of the differences between 'royal science' and 'nomad science'.

[7] Again the term philosophy here is used in the same manner as science. It refers not to the general discipline, but, in the context of *What is Philosophy?*, to Deleuze and Guattari's general attempt to think the creative and productive work which philosophy might do. Thus concepts are what philosophy *produces*, and they are interested in both producing concepts and creating a formulation of 'the concept' which reflects their overarching philosophical concerns.

Chapter 6

Assembling Cyberspace

There is no assemblage without territory.

Gilles Deleuze and Claire Parnet. *Dialogues*

This project began from an initial discomfort with the enthusiastic proclamations of transformation emanating from a range of cyber-feminists. I have argued that, while such claims have indeed brought attention to the various sites where transformation must occur, those concerned with theoretical reconfiguration have in the main been unable to offer a convincing account of any possible transformation. They remain embedded within a logic of identity that is fundamentally hierarchical, unable to apprehend difference as difference in kind, including sexual difference, and deterministic in structure, such that the possibility of radical transformation is foreclosed. I have claimed that theorising transformation must include a rethinking of the very frameworks of knowledge through which events, bodies, technologies and phenomena such as cyberspace are apprehended and understood. In the previous chapter, I proposed that Deleuze and Guattari offer a range of concepts through which to approach such a rethinking. I suggested that they elaborate a conceptual horizon within which difference might be apprehended as difference in kind, rather than through the structure of identity. Moreover, I have argued that within their conceptual horizon transformation might be thought, due to the articulation of an-open ended movement of becoming, rather than a deterministic and closed logic of identity. They create a series of concepts that can apprehend and explain the movement of differing, or becoming, within seemingly concrete and fixed bodies and phenomena and, as such, allow for the possibility of transformation.

In this chapter, I return to cyberspace in order to explore in more depth how this range of Deleuzian concepts might generate an understanding of it that will move beyond the confines of the logic of identity. This exercise is not aimed at producing a full and final account of what cyberspace is – divining its essential truth – but rather at demonstrating

the very different understanding of cyberspace that appears when it is thought through an alternative conceptual horizon. I will argue that this understanding avoids the recurrent conceptual problems identified in chapters three and four and, in doing so, demonstrate how conceptualising cyber-practices along the lines proposed by Deleuze and Guattari might allow other transformative possibilities to come to light. Adopting an alternative conceptual framework is not in itself the arrival of wholesale transformation, but it is a necessary step toward explaining the operations, components and particular orders that comprise practice in such a way as to account for their concrete operations without foreclosing the possibility of radical change.

While there are many different combinations of social practices and technological arrangements under the umbrella of cyberspace, this chapter will focus on the real time interactive practice known as a MOO (MUD object oriented).[1] The activity of 'MOOing' has attracted much attention in the exploration of new possibilities for identity and community that cyberspace might generate. In the practice of 'MOOing' remotely located computer participants connect to a central site via the internet. The central site is constructed to function as a social space, in which participants can engage in various activities, including communicating in synchronous time with each other, constructing objects, gaming, role-playing, exploration, political organising and research activity. Such domains proliferate across the internet and, due to the social interaction they facilitate, reflect the widely shared understanding of cyberspace as a social space, a habitable place and a built environment. Julien Dibbell, noting the apparent incongruity between the technical and social aspects of LambdaMOO, one of the earliest and most well known MOOs, offers a useful distillation of the variety of elements comprising a MOO:

> Not an enchanted mansion or anything of the sort – just a middling complex database, maintained for experimental purposes inside a Xerox Corporation research computer in Palo Alto and open to public access via the internet. (1994:240)

He delineates a twofold social/technical composition of the MOO: the 'enchanted mansion' facet, that is the social spaces of the MOO; and the 'data base' facet, the network of technologies, software and protocols. This combination of social and technical has been the focus of much speculation regarding the transformative potential of cyberspace, particularly in terms of the profound implications it raises for corporeality. The MOO, as a cyberspace where technologies and bodies intersect within a general discourse of liberation and transformation, is an exemplary site at which to explore the implications of the conceptual shift Deleuze and Guattari make. In this chapter, I want to undertake a mapping of LambdaMOO as an assemblage along the lines of the two axes Deleuze and Guattari describe:

> On a first, horizontal axis, an assemblage comprises two segments, one of content, the other of expression. On the one hand it is a *machinic assemblage* of bodies, of actions, and passions and the intermingling of bodies reacting to one another; on the other hand it is a *collective assemblage of enunciation*, of acts and statements, of incorporeal transformations attributed to the body. Then on the vertical axis, the assemblage has both *territorial sides*, or reterritorialized sides, which stabilise it, and *cutting edges of deterritorialzation*, which carry it away. (1987:88)

They elaborate in great detail and complexity the internal dynamics of the assemblage. However, rather than faithfully applying a schematic model, in order to offer an exhaustive description of the component bodies/machines of the MOO assemblage, I want to develop a more general sketch of the MOO assemblage in terms of these four vectors. Such a process will serve to demonstrate how this model of assemblage is

propelled by the conceptual shift necessary to thinking difference, as well as the consequences such a shift entails for our understanding of the practice of MOOing.

MOO-machines

> For the moment, we will note that assemblages have elements (or multiplicities) of several kinds: human, social, and technical machines ... (36)

Deleuze and Guattari contend that assemblages are comprised of various elements, bodies or machines, all multiplicities whose forces meet, react and achieve a meta-stability that characterises a particular assemblage. Bodies in this instance refer not just to human bodies, but to the various component bodies that comprise the assemblage. This understanding of the components of the MOO as multiplicities works to counter the problematic of the prosthetic as an explanatory framework for the meetings of bodies and technologies. Within the prosthetic explanation of technology/body interaction, difference is accounted for only as difference in degree and technology understood in an instrumental manner. If, on the other hand, we think bodies and technologies in terms of component bodies of an assemblage, or multiplicities, then such a recourse to identity becomes avoidable.

Dibbell points to four key components, or bodies/machines, of the LambdaMOO assemblage: the body of the mansion, the body of information, the social body, and the bodies of participants. Doubtless there are other component bodies, but an examination of these four provides sufficient material to gain an insight into the status of components as multiplicities. Moreover, an assemblage is characterised, not only by the composition of its components as multiplicities, but also by the mode of assemblage, that is, the movement of linkage and connection. This, too, is an important point in terms of

displacing the prosthetic account of the meetings and interactions between components. These two aspects of an assemblage are, of course, inextricable: the particular forms and functions of the components within the MOO- assemblage are conditioned and configured in the process of intermingling that makes the MOO functional. I want to explore these two key characteristics of the assemblage with regard to each of the four component body/machines of LambdaMOO, outlining briefly their individuated forms and functions within the assemblage, and then considering in more detail the states of intermingling in which each component encounters the others.

The Body of Information

> A MUD is a software program that accepts "connections" from multiple participants across some kind of network (e.g., telephone lines or the Internet) and provides to each participant access to a shared database of "rooms", "exits", and other objects. (Curtis 1997:143/4)

The term information has many inflections within discourses of cyberspace. While there are significant theoretical and scientific debates over the ontological status of information, in this instance I will focus on information as it is commonly figured in discourses surrounding MOOs.[2] Information is a key factor in terms of the conventional model of a MOO, as a disembodied immaterial information space, in which the matter of bodies is unable to participate. This understanding of information as separate, and separable, from the various physical structures which instantiate it has been problematised by Hayles (1996, 1999, 2000). Following her argument, a broader conception of information will be required in order to think information in terms of assemblage, that is, as a functional element, body and multiplicity. A body of information, or information machine, as a functional element of a MOO assemblage, is composed of the multiple information events, paths, technical configurations and

materials that comprise the informational aspect of the MOO assemblage. At some points, this configuration coincides with other understandings of the role and status of information, but in others extends or diverges from them. For example, in the instance of LambdaMOO, the body of information cannot be reduced to purely cybernetic formulations of feedback and response. Nor is it simply the conventions of computer programming and coding that structure communications and order the relations between hard and software, nor the binary digital code, nor the content of communication events. Rather, I would claim that a body of information can be discerned in the MOO assemblage, which is comprised of all these events and arrangements and more. Thus, delineating the information body or machine of the MOO assemblage, instead of attempting to describe what information is, it is better described in terms of its functions and connections.

In this register, then, the body of information in the MOO assemblage comprises the flows and paths of information circulation, the 'hard' and 'soft' components of those flows and the points of entry and exit into that flow. It can be thought as a multiplicity of heterogeneous components of hardware, software, messages, structures, inputs and outputs of energy, protocols and communication events, which become configured in particular ways in the process of intersecting with other elements of the MOO assemblage. This is to go further than Hayles, for while allowing that information cannot be understood in entirely immaterial terms, I also wish to refuse any clear cut delineation of a physical hardware 'base' supporting a software 'superstructure' of information. Rather, both become components of the body of information to the extent that the function of information circulation traverses both and requires both. The significance of this refusal of an information/matter dichotomy will become apparent

when we move to examine the interactions between the body of information and other component bodies of the MOO assemblage.

Body of the Mansion

All MOOs are furnished with locations, maps, objects and structures that function in part to delimit a place and demarcate spaces of activity. These vary according to the nature of the MOO, from medieval castles and forests to post-industrial smoking ruins of cities. In LambdaMOO this constructed 'place' can be described as the body of the mansion. While LambdaMOO has grown beyond the original mansion walls, into forests and fields, caves and caravans, sheds and driveways, the mansion remains the first point of entry and the focal point. It is constructed as a domestic residence, with corresponding living room, bedrooms, kitchen, lounge, coat closet, garage, and so on. Participants navigate the mansion by means of doors and stairs, mapped out on a conventional compass grid. Rooms are furnished with objects, some conventional such as domestic appliances – refrigerators and ovens in the kitchen, desks and bookshelves in the study – others fantastic – magic machines and other devices. Each of these objects and spaces is presented to the participant in the mode of a textual description. For Dibbell, while he is interested in how such technical/textual configurations become invested with sociality, the 'reality' of the objects and spaces of the mansion is reducible to a pattern of coding:

> As far as the database program is concerned, all of these entities – rooms, things, characters – are just different subprograms that the program allows to interact according to rules very roughly mimicking the laws of the physical world. (Dibbell 1994:240)

Dibbell's description typifies the assumptions that underpin the understanding of the MOO as a disembodied place: that information and matter are in opposition. Moreover, he makes a further distinction, which underwrites the concept of virtual that prevails in the discourses of cyberspace. The entities, objects, rooms, of the body of the mansion, in so far as they are conceptualised only in terms of information, can be distinguished from the 'real' world, the physical world, which they mimic. This is a common theme in discourses of liberation in cyberspace, that the 'virtual' world of cyberspace is more open and less restricted than any 'real' world. This notion of the virtual is inconsistent with that of Deleuze and Guattari, as it makes a distinction between 'virtual' and 'real'. As we saw in the previous chapter, according to Deleuze and Guattari the virtual is possessed of its own reality. In line with them, I would argue that this distinction between 'virtual reality' and 'real life' is untenable, and, moreover, not particularly useful in terms of understanding the MOO- assemblage.

I would claim that encountering the objects and spaces of the MOO principally in textual form does not automatically banish them from 'reality'. To attempt to account for the mansion and its contents in terms of a correspondence or divergence from a 'real' counterpart is to obscure their own specific qualities and functions. Each object and space intersects with the other component bodies of the assemblage in specific ways, the arrangement of which constitutes the dimensions, contours and functions of the MOO assemblage. For example, the rooms of the mansion function to distribute participants and work to establish social orders based on access. Various objects, for example games, likewise function in the demarcation of privileged social groups by virtue of competence and familiarity. Clearly, the functions and linkages of the body of the mansion are more complex than the mere textual representation of a 'real' life space.

Reducing the mansion and its contents to a base code can only be done if the various functions of the body of the mansion, and its points of contact with other component bodies of the MOO, are ignored. Moreover, a very different understanding of the contents of the MOO is possible if we think it as an assemblage. In terms of an assemblage, Dibbell's account of databases and subprograms is describing only one point of contact between the body of the mansion and the body of information. For the cyberspace assemblage of the MOO to function, the body of the mansion and its contents are always more than coded subprograms. Likewise, the impulse to describe the spaces and objects furnishing the MOO as pale imitations of the 'real' world, or representations of 'real life', belies the complex functionality of the body of the mansion within the MOO assemblage, to which I will return in more detail later.

The Body of the Social

As with the other component bodies of the LambdaMOO assemblage, the body of the social has multiple aspects or is itself assembled of multiple elements. In this instance, I want to touch on two significant ones, which give some indication of the range of dimensions of this social body. The social body of LambdaMOO concerns both the population characteristics of the MOO, and the social 'structures' that organise and contour its social functions.

Dibbell describes the population of the MOO as composed of 'characters'. However, I would suggest that the terminology of 'character' works to suggest a distinction between a 'real life' subject and an 'unreal' or 'virtual' representative. It is on the basis of the capacity to freely shape such 'representatives' that a certain possibility for transformation is based. I will return to this question of the distinction between 'real

life' and 'virtual representative', but first want to consider the participants as they function as a component of the social body of the MOO. As we saw, in one register, participants are individuals who engage with the MOO through engaging with its technological, access, protocol and communicative arrangements. That is, a participant is an individual possessed of the means of access and a minimum level of competence. This is not to suggest that this engagement proceeds along prosthetic lines whereby the individual *uses* a technology to extend their activities and capacities into the specific social space of the MOO. Rather I would suggest that a participant finds their particular functions and characteristics, *as* participant, through the process of assemblage in the practice of MOOing. That is on encountering the various other components of the MOO, individuals become participants. Thus the population of the MOO is not simply a prosthetic aggregate of fixed individuals, technological devices, protocols and practices. Rather, in the process of assembling, participants find the particular functions, qualities and relations with other objects and entities, which articulate them as MOO participants and members of the social body. Participants are articulated, as such, in the process of entering into the assemblage of the social body and dwelling within the confines and parameters that set the horizon of the social body.

The social body of the MOO is not, however, simply the aggregation of qualified participants undertaking a delimited range of activities. It equally comprises systems of governance and regulation as well as protocols of social interaction. These are explored by Dibbell, who charts the formation of more formalised social forums, decision-making processes and sanctions within LambdaMOO, following a rape incident.[3] Within the MOO, there is a functioning hierarchy in which certain 'wizards' have powers of sanction and expulsion and administer systems of grievance and redress. These

comprise a social body that is not an imitation of a 'real life' community, nor a utopian vision, but which defines the contours of an actual social body within the MOO assemblage. This body of the social comprises discourses of citizenship and social responsibility, which sanction certain activities and prohibit others, permits or denies access. While some of these functions are 'hardwired' into the MOO, that is, the body of information facilitates certain possibilities and excludes others, they more often function by consensus rather than through technical restriction. Dibbell's description of an incident of rape demonstrates this: setting out the possibility of breaching or overriding basic programming codes of the MOO, in order to undertake unsanctioned and socially unacceptable activities. Thus, the social body of the MOO cannot be accounted for simply in terms of what is possible or not according to technical specifications, but rather it is an assemblage of various components.

Bodies of Participants

In the previous chapter, I considered how bodies might be generally described in terms of assemblages. Taking up this conception of bodies, I would argue, contrary to claims that cyberspaces such as LambdaMOO are places of disembodiment, that within such an assemblage the bodies of participants are in constant commerce with the bodies of information, the social and the mansion. It is not a disembodied participant that is a component of the MOO assemblage but rather, it is a particular body, with its own specific contours, functions and mix of material and immaterial attributes. I am not concerned here with presenting an anatomical account of the physical attributes, activities, organs and systems comprising bodies of participants. Rather, I want to consider bodies of participants as being themselves assemblages of flows, energies, and

materials which find particular configurations in the linkages and interchanges that comprise the MOO assemblage. In this context in the next section I will undertake a mapping of the bodies of participants through an examination of the particular bodies that emerge in the meetings of forces and linkages between bodies of participants and the other component bodies of the assemblage.

We can note some initial differences between this account of a MOO and one which proceeds on the basis of the logic of identity. Firstly, information is not a privileged mode or mechanism that determines all other elements of the MOO. Secondly, the mansion as the internal architecture of the MOO space cannot be sufficiently described as virtual, in opposition to a 'real world', but rather is actual to the extent that it is a state of affairs and is itself real. Thirdly, the social body of the MOO comprises various component elements, including a membership, orders, and conventions that are not circumscribed by technical considerations, or resemblance to 'real world' social formations, but which find their particular configuration in the matrix of linkage and connection between the various components of the MOO. And finally, within the MOO assemblage, individuals are by no means disembodied. Moreover, the bodies of individuals do not occupy a prosthetic relation with the technological components of the assemblage. Rather the sites and scope of the relations between these elements are more complex and, moreover, mutually conditioning. This is due to the twofold nature of an assemblage whereby: the elements themselves are intensive multiplicities that are not simply aggregations of discrete units; and the mode of linkage and connection between elements is such that it will impact on the articulation of each element.

As I noted in the previous chapter an assemblage is not a structure that functions as a transcendent whole, into which parts are integrated. Rather, an assemblage is simply the total of its components and therefore should those components alter, the assemblage as such alters: any change in the parts, gives rise to a new multiplicity, a new assemblage. Clearly, some of the components of assemblages have to be understood as pre-existing it, but this does not necessarily mean that they cannot be understood as multiplicities and as having a singular and specific articulation within any given assemblage. These singular configurations arise due to the embeddedness of each component in a relational field of connection and intermeshing with the other components of the assemblage. As these relations alter, so too does the particular configuration of the component, as well as that of the assemblage as a whole. I want to look further at the information machine component of the MOO assemblage, in particular the internet as an element of that machine, to demonstrate how the components of the assemblage are themselves assembled.

Assembling the Body of Information

I claimed earlier that the body of information of the LambdaMOO assemblage is neither reducible to the sum total of 'communication contents', transmitted via the various channels of the internet, nor to the programming structures orchestrating the paths of transmission, the coding and decoding. Rather, I have argued that the internet is one facet of a body of information which in, connection with the various other elements, is articulated along particular lines. The global networked conglomeration of communications and computing hardware and software, termed the internet, is generally understood to be the information infrastructure of cyberspace. I am not concerned here with technical explanations of computer hardware specifications and software

development, which have been conducted at great length and with great insight elsewhere.[4] Rather, I want to examine the particular configuration of these systems that appears in the MOO assemblage.

Initially devised and developed for military purposes the 'internet' is an umbrella term that covers a wide range of information circulation functions including email, advertising, database searching, broadcasting, chat, publishing, creative endeavours and so on. These variant practices are commonly considered 'applications' of a single technical apparatus. However, this understanding fails to acknowledge the very different and diverse assemblages, of which such practices might be functional components, and which deploy particular arrangements of the network of hard and software. For example, in the transmission and reception of email a point to point passage of information occurs or in the case of email mailing lists, a point to multi-point distribution. Each practice must be distinguished in terms of the assemblage within which it is a component. That is, there are different information 'machines', which may all sit under the umbrella term 'internet', but remain highly specific.

MOOing engages with particular aspects of the information-processing and distribution functions of the technologies of the 'internet' and deploys them in highly specific ways. For example, one function which is crucial to the MOO phenomena is the co-presence of participants independent of geographical location and time differences at the point of access. Thus, the MOO employs the technological function of co-presence, as opposed to other technological capacities of the internet such as those that distribute information between points in asynchronous communication arrangements, for example listserves, or email. Further, with MOOs the information dissemination and retrieval technology is

ordered so that the flow of information circulates around a particular site as a base, a 'home' server such as PARC, which Dibbell describes. This particular server houses the information structure of the MOO, the mansion, the protocols and so on, to which all participants migrate so as to engage with the MOO. Thus, the distributed networks and myriad of possible routes that information can take through the wider networks of the internet becomes ordered, in the instance of the MOO, by a common destination. The paths to the MOO may well be varied and will vary each time, but the destination is fixed, the end point stable. This configuration of the flows of information is clearly distinct from the meandering lines of never-ending paths of hypertext in the world wide web. The MOO requires the synchronous presence of participants and a dissemination of communication information from point to multi-point: for example when a participant 'speaks' to a room, to announce their presence, all other participants in the room will receive the greeting. The MOO also operates as a point to point distribution, for example in 'private' conversations restricted to particular parties. These distributive paths of information require particular configurations of hardware and software in order to function. However, they are not determined by these, but rather in the assembling of the MOO these configurations are taken up and set into operation. Thus the 'internet' is not simply a hardwired cable conduit across which information flows. Rather, as a component of the larger information machine it becomes articulated through its intersections with the other bodies of the MOO assemblage, is configured in particular ways, takes up particular capacities, shuts down others, sets particular flows in motion and blocks others.

Meshworks – Intermeshing the Assemblage

> We think the material or machinic aspect of an assemblage relates not to the production of goods but rather to a precise state of intermingling of bodies in a society, including all the attractions and repulsions, sympathies and antipathies, alterations, amalgamations, penetrations, and expressions that affect bodies of all kinds in their relations to one another. (Deleuze & Guattari 1987:90)

Conventional accounts of the MOO are unable to offer anything but disembodiment, because they rest on a rigid distinction between information and matter, in which the MOO must be conceptualised as an entirely information place. The concept of assemblage, along with other Deleuzian concepts, offers a more complex account of the practice and formations of MOOing. In the brief outline of some of the components of the LambdaMOO assemblage, we saw these components as heterogeneous multiplicities, which were neither ordered around a founding identity, nor structured by a transcendent cause. The component bodies of a MOO assemblage affect or are affected by each other in the encounters between the actions, passions, flows of particles and energies that traverse those bodies and the blockages, negotiations and respective states of speed and slowness that emerge in those encounters. By examining a number of these intersections, we can find an explanation for the particular formations of the various components and a demonstration of how a contingent meta-stability is achieved, whilst also observing how components remain open-ended multiplicities. Again, this will not be an exhaustive account, but rather a broad-brush outline of some of those intersections and how this meshwork of meetings gives rise to the assemblage on an immanent plane.

An obvious starting point is the flow of energy transfer that is apparent when the body of the participant intersects with the body of information such that information, is

propelled along particular itineraries. That is, the encounter between the flow of information and the sites of information reception, transmission and dissemination in the eyes, brain, neuro-musculatory system of the body of the participant, propel the flow of information within the body of information along particular itineraries and at particular speeds. The encounter with the body of the participant is not the only instance that generates speeds or slowness within the body of information: other interventions, such as viruses, electrical surges, overload, lag, system failures, faulty coding, firewalls, unpaid bills, denied access and V-chips might equally impact on the flow and itinerary of information. All these moments occur in the encounters between the various bodies of the assemblage and all 'work' the body of information in different ways: directing or regulating, speeding or slowing, the circulation of information, which shapes its particular characteristics and functions within the MOO assemblage. In this manner, the body of information finds its specific articulation in both the necessary deployment of specific technological configurations and the intersections, linkages and connections with other bodies of the assemblage. Moreover, the body of information is not simply affected, but also affects the other bodies of the assemblage.

One of the structures or pathways of distribution within the body of information – the point to which the multi-points gravitate – is the particular internal programming edifice that is the MOO construct. This is a particular distribution of information, which creates and operates the internal landscape of the MOO itself, in the case of LambdaMOO, the enchanted mansion. If we look at how the body of the mansion meets the body of information, we can see that the mansion is not simply a programmed informational construct, but that it equally impacts on the patterns of distribution that characterise the body of information. In its construction as a domestic residence and a

site for social activities, the body of the mansion elicits a 'coming to' from participants. The body of information is thus configured in such a way as to transport participants to the mansion, rather than the mansion to the participants. It could easily be argued that the mansion is in fact transported to the remote terminals of the participants, who engage with it locally, and thus that there is a 'mansion' for each participant, rather than a central mansion to which participants come. However, at this point, the mansion, in its relation with the body of the social, intervenes in the information distribution and flow to 'bring' and 'centralise' remote participants to a single site. Thus, the flow of information is organised to support the mansion in its central meeting place function.

The meetings of the body of the mansion, the social body and the bodies of participants also impact on the body of information. This is apparent when we consider the body of the social. The flows and itineraries that traverse the body of information intersect at various sites with those of the body of the social and from these meetings the particular dimensions and configurations appear which characterise the MOO assemblage. It is not on the level of programmed parameters of social interaction that the body of information intersects with the body of the social. That is, the social is not constituted by 'a' program that allows or disallows certain activities. The rape case demonstrates that nothing is ever entirely precluded and that social convention is an intervening factor in distributing and shaping the program. Another point of intervention is the regulation of access. In this instance, the body of the social intervenes directly into the body of information. If the body of information of the LambdaMOO assemblage is in part comprised of the networks of information distribution, these do not simply function as a technological base for a social superstructure. The body of information intersects with the social in so far as, within the MOO, particular modes of access and specific systems

protocols are required in order to enter the social spaces of the MOO. Membership of the social necessitates, not only appropriate hardware, but also access to internet service providers. To engage with the technical configuration of the body of information requires observance of protocols, which range from the basic, such as email addresses, passwords and usernames, to the complex, such as programming commands to construct objects. These various requirements do not simply act as modes of access: they delimit the social in particular ways. Irrespective of the degree of complexity, the protocols impact on the function and composition of the social body of the MOO assemblage, both in terms of exclusion of the inadequately equipped and by demanding compliance with particular sets of protocols. These points of entry or exclusion can be generated and mobilised at any number of sites: university restrictions on un-academic activity on university-provided servers, entrance requirements for names and character descriptions, financial restrictions as to the amount of pay per minute server time that is affordable, language of use and so on.

Much has been written as to the exclusivity of internet access and the restricted demographics of those who participate. (Slevin 2000, Ebo 1998, Brooke & Boal 1995) However, I am not concerned here to record the demographic particularities of the social body of the LambdaMOO assemblage, but rather to demonstrate that the forces which shape the social body of MOO assemblage are inseparable from those of technology, socio-economic circumstances, and so on. Thus the social body of the MOO is more than simply an aggregate of the participants that belong to it. The requirements and protocols of access embodied in the social regulate the inclusion, exclusion or expulsion of participants into the body of information and, in doing so, direct the flows of information along particular paths. These social requirements facilitate altered

functionalities and distributions from the body of information. For example, the social demand for means of retribution or sanction necessitates a mode of withdrawal of the body of information from the bodies of participants; or the protocc'; and competencies of access extend the body of information along particular lines of distribution. Other social interventions into the body of information, such as the predominance of the English language as medium of social interaction, set out a particular geography of flow for the circuit of information across the global network of the internet. However, it is not a case of the social body dictating the configuration of the body of information. Information contours the attributes of the social in the most simple ways, such as access as a factor of population characteristics, and in more complex way as it intersects with governance and protocol, for example withdrawal of access, removal from the circuit of information, as a response to anti-social activities. The body of information is also involved in the elaboration of certain hierarchies within the social. The degree of access and ability to instigate informational distributions are markers of the power held by wizards or participants possessed of a certain level of prowess and experience. These have the license and ability to intervene in the body of information and to direct it into the construction of elaborate spaces and activities. A minimal engagement with the body of information, for example by those who are recent arrivals to the social, relegates the participant to a marginal position.

Clearly, there are a multitude of points of intervention and interaction between these bodies and, equally clearly the bodies are inseparable from the field of relations within which they finds their local constitution. Thus, as well as intersecting with the body of information, the social body engages with the other bodies that comprise the assemblage, including the body of the mansion and the bodies of participants. The

social body intersects with the body of the mansion at a multitude of sites, most obviously in the demarcation of private and public spaces and in determining the degrees of freedom and restriction to traverse the spaces of the MOO. The body of the mansion works, in ways similar to Foucault's prison or hospital, to distribute the social along particular patterns, communal, public, personal, private and restricted. The space of the mansion works to demarcate and distribute the social along lines of longevity and prowess. The mansion comprises spaces for open communication exchanges between newly arrived members and places for more fully integrated members to meet away from the new arrivals. This requirement for distribution of inhabitants demands a particular construction of the mansion and intervenes directly into its body, for example, through notice boards or common places of entry, particularly for the induction of recent arrivals or visitors, figures on the margins of the social, not yet fully integrated into the core social body. Access to increasingly restricted zones of the mansion, indeed construction of personal, private rooms, marks integration into the social, into the hierarchy of prowess and longevity. In the practice of experienced long-term members constructing their own private spaces or devices for the exclusion of the uninvited, we can see how the body of information intersects with the social and the mansion. Access to the flow of information is not equal amongst all inhabitants and the structure and formations of the mansion reflect this. Thus social order structures the mansion and directs the flows of information in particular distributions. This is not to say that the social has a determining status, since the meeting of information and the mansion also impacts on the social. One example of this is the disruptive capacity of those less integrated into the social to redirect the body of information in different ways through the introduction of viruses, 'anti-social' communication practices such as flaming and sexual harassment, or more serious transgressions of the social as in the rape. The

mansion is not constructed solely at the behest of social requirements for levels of exclusion: it too is open to rupture and splinter.

As with the bodies of information, the mansion, and the social, so too the bodies of participants connect with the various component elements of the MOO assemblage in a manner that impacts on their form and function within the assemblage. Clearly, in the LambdaMOO assemblage the bodies of participants constantly intermingle with the circuitry of distribution and flow of the body of information in a way that articulates particular bodies. This is not to say that 'a' body enters into an already operating circuitry of information, which produces some effect. Rather, any circuit of information is composed in part through the connections of the information machine with the forces, actions and materials of bodies of participants. This is apparent in the intersection of information and the kinetic activity of the fingers and arms and the electrical impulses of the brain, which set in motion particular itineraries of information. Information here refers to the body of information, not information as an ethereal pattern or content of communication. I am describing the ways the forces and components of bodies of participants are articulated in relation to the forces and components of information, ranging from corporeal activities, such as reading and typing, to the distribution of participant bodies in time and space, and their relations with bodies of technological artifacts and objects, keyboards and screens, all of which participate in articulating the bodies of participants. In the meshing of the itineraries of circulation of the body of information with the forces of bodies of participants, relations of speed and slowness are elaborated, some of which accelerate the flows of information into muscular reactions, gestures, postures and flows of synaptic energy, others of which slow it at points of blockage such as fatigue, repetitive strain injury, strained eyes, headache, and

boredom thresholds. These meetings impact on the articulation of both bodies within the assemblage: bodies of participants are integrated into information flows and structures; and information is animated and directed by the energies and blockages of bodies of participants.

As with information, bodies of participants are equally articulated through the intersections with the body of the mansion. These meetings occur in a number of modes, for example in the activities and functions of bodies 'occupying' the mansion (locating and moving), individual articulations of qualities of appearance and attitude, sexual activity, gaming and violence. It is neither possible nor useful to make the kind of commonplace distinction between a 'real' body and a 'virtual' body, in which the bodies that act within the mansion are 'virtual' and distinct from a 'real' body seated at a computer screen. The bodies of participants are instead distributed across, or make connections with, the entire assemblage of the MOO and include their functions within the mansion, as well as their interactions with the other bodies that constitute the assemblage. Therefore, it is not a matter of describing bodies within the mansion as functioning to present a character, or enact a scenario such as a sexual encounter, along the lines of representation. On the contrary, the bodies of participants function, not as a representative nor agent of a subject, but as a means of occupying, a mode of inhabiting and a means of engaging in certain activities. For example, the practice of cybersex is clearly an embodied activity, in which the configuration of bodies of participants, the mansion, the social and information have an obvious impact on the distribution of the erotic contours and economies of bodies. This is not to reiterate an 'on both sides of the screen' version of embodiment, with some connecting medium, such as fantasy or imagination between the two.[5] Rather, the bodies of participants are assemblages of a

variety of components that are brought to proximity and congeal as an assemblage, by virtue of their interactions with the other bodies comprising the cyber-assemblage of LambdaMOO. Thus, the bodies of participants walk, sit and play in the rooms and hallways of the mansion as well as forming components of the distribution network of the body of information and entering into relations with other participant bodies in the social assemblage. It is not simply a mental 'representative' of the body that undertakes these activities. Rather, it is a body functioning in one register as orienting point, a location point, a flow of directionality and movement that traverses the bodies of participants. In order to 'place' a participant as 'in' the mansion, a bodily orientation and compliance with boundaries and structures is required.

As Foucault has shown, social machines are always concerned with the activities of bodies. Bodies are configured and articulated so that they are amenable to the social and are intelligible within the social. The social body works to distribute participant bodies and their functions in particular ways: for example, it regulates contact, deems appropriate certain activities and restricts others. A clear example of the regimes of ordering comprising the social machine in the LambdaMOO assemblage is in the allocation and observance of sexual identities. The social accepts a variety of stated versions of sexual identity, male, female, neuter, plural and a number of others, which, in the first instance, seems to open up the field of possibilities for bodily configuration. However, I would argue that it is equally a mode of restriction, an act of ordering. In the very act of requiring a declaration, of setting sexual identity as a characteristic for identity or field of description, the social body is instigating a requirement, or putting in place a set of criteria, which will work and categorise participant bodies along particular lines.

In this very brief and schematic sketch of some of the bodies and linkages that comprise the machinic component of the LambdaMOO assemblage, I have attempted to illustrate the significant characteristics of assemblages in general and to contrast these with the conventional accounts of MOOs. I have focused on the components as multiplicities, as collections of heterogeneous elements that intersect with other multiplicities to give rise to particular, local formations. As multiplicities, the components of the assemblage are open to difference as well as to the possibility of entering into becomings, as they make other connections and linkages. These various component bodies, or machines, comprise what Deleuze and Guattari refer to as the 'content' aspect of an assemblage. I want now to turn to the 'expression' aspect which in any assemblage relates to statements, discourses and words.

MOO Expressions

> From descriptions of characters to political processes, all of LambdaMOO is constituted through words, based in language. Rooms, people, objects, technology and politics, all consist of nothing but words and signs. Within LambdaMOO, it is not just communication that takes place in and through language, but the material substrate of LambdaMOO itself, its physical spaces and manipulable objects, its social institutions and political processes, as well. (Mnookin. 1996 n.pag)

Accounts of MOOs as disembodied spaces of social interaction propose that, having displaced the corporeal or material, information now becomes primary. Information exchange functions as the basis of a range of communication events, which in turn serve as the basis for communities, interpersonal relationships and, importantly, the ability to articulate alternative identities. I have critiqued this account on a number of fronts and have claimed that, when understood in terms of assemblage, the initial movement of

disembodiment is untenable. I want now to consider the communicative aspect of the MOO, which is its fundamental characteristic, according to Mnookin, and others. (Curtis 1997, Reid 1995, Bromberg 1996) In the first part of this chapter, I explored how the distribution and machinery of information might be understood as a component multiplicity of the assemblage, such that it does not automatically demarcate distinct information and material realms. I claimed that one element of the body of information in the MOO assemblage was the flow of exchange between the various inhabitants of the MOO. But what of the content of these innumerable communication exchanges and events that traverse the MOO assemblage? They might be understood in terms of the other vector of the assemblage Deleuze and Guattari outline. The utterances, discourses, signs and words that circulate through the MOO assemblage belong to what Deleuze and Guattari term the collective assemblage of enunciation (Deleuze & Guattari 1987:88). They comprise the expression aspect of the assemblage which, along with the content aspect of the machinic assemblage, form one axis of an assemblage. This offers a very different way of understanding the activity of MOOing, which can counter some of the persistent conceptual difficulties of conventional accounts, especially those of representation, subjective agency and structure. All three are linked in conventional accounts of MOOs, as in the claim for example, that by representing themselves in the MOO, according to their own desires, participants can achieve a measure of subjective liberation. Other representations, such as those of objects and actions, are understood to mimic 'real life' forms and actions.

As we have seen, this model of representation is grounded on the logic of identity or sameness, where a representation is conceived only in terms of a degree of departure from, or similarity to, an original. However, if we consider the utterances, expressions

and even the textual depictions of the MOO, in terms of Deleuze and Guattari's understanding of the assemblage of enunciation, we can account for them other than as representations. In articulating the notion of a collective assemblage of enunciation, Deleuze and Guattari refuse the hierarchy implicit in the structure of representation. They propose a relation of immanence between expression and content, whereby the collective assemblage of enunciation "does not speak 'of ' things, but it speaks on *the same level* as states of things and states of content" (1987:87). For Deleuze and Guattari, expression connects with content, language with bodies, words with things, the linguistic with the material, the enunciative with the machinic, but not through a relation of representation. Rather:

> expressions or expresseds are inserted into or intervene in contents, not to represent them but to anticipate them or move them back, slow them down or speed them up, separate or combine them, delimit them in a different way. (86)

The intervention of expression into contents is explained by Deleuze and Guattari through a consideration of the relation between speech and action. They claim that action is implicit in language, that is, language has the capacity to transform. They use the term order-word (*mot d' ordre)* to explain how language accomplishes this.[6] The most explicit example of an order-word is the performative, which is a class of speech act in which the act of saying effects a change in the state of things. Massumi gives the example of the 'I do' of marriage:

> Say 'I do', and your life will never be the same. Your legal, social, and familial status instantly changes, along with your entire sexual, psychological and financial economy. (1996:28)

Performatives have long been considered a special category of speech act. However, following Austin, Deleuze and Guattari see the performative, not so much as a special

category, but rather as the most manifest instance of the transformational dimension within every statement (1987:30). The performative is an example of what they describe as the intrinsic relations between speech and action (77). The intrinsic relation in the performative is apparent in the fact that the saying accomplishes the action. Deleuze and Guattari argue that these intrinsic relations are not restricted to the performative, but are equally in place in the illocutionary, where actions are accomplished in speaking: " I ask a question by saying "Is...?" I make a promise by saying "I love you ....."; I give a command by using the imperative, etc" (77). Thus, accompanying the semantic content of the statement is a non-discursive 'force', which effects the act. Deleuze and Guattari, following Ducrot, go on to claim that it is not possible to separate the semantic from the nondiscursive dimension in any strict way. They see these immanent relations between speech and action, in so far as the acts are internal to speech, as *implicit* or *non-discursive presuppositions*, that is, as inhering or subsisting within language as distinct from the explicit assumptions, through which statements refer to other statements or external actions (77). Thus they conclude that every statement is an order-word:

> Order words do not concern commands only, but every act that is linked to statements by a "social obligation". Every statement displays this link, directly or indirectly. Question, promises are order words. The only possible definition of language is the set of order-words, implicit presuppositions, or speech acts current in a language at a given moment. (79)

This implicit presupposition introduces a relationship of redundancy, rather than representation, between statements and acts. That is, each statement accomplishes an act and the act is accomplished in the statement (79). For Deleuze and Guattari, the actions implicit in speech, and by extension language, can be understood as incorporeal transformations. The 'I do' of marriage is an explicit instance of this. Such actions

intervene into bodies and are attributed to bodies, but are distinct from the actions of bodies, as they are strictly incorporeal. Thus, for Deleuze and Guattari, it is impossible to conceive of speech as simply the communication of information:

> to order, question, promise, or affirm is not to inform someone about a command, doubt, engagement or assertion but to effectuate these specific, immanent and necessarily implicit acts. (77/8)

It is in this light that I want to examine the statements that circulate in the MOO: not in terms of the content of information exchanges, nor the representative status of textual descriptions of objects and events, but rather as a set of statements that have implicit in them transformations and actions.

I would suggest that, in the LambdaMOO assemblage, one prominent class of statement is that of location.[7] A variety of utterances, signs, textual descriptions, including expressions such as 'you are here', passwords, welcome messages, maps, instructions on operating the MOO, directives to move through exits and entrances, invitations, teleports and so on, comprise this class of statement. These expressions do not function to describe or represent an environment or series of objects and actions to a participant. Rather, they intervene in the assemblage to bring about particular arrangements of the various bodies of the assemblage. They work to effect a concentration of bodies and a congregation of bodies. For example, the information machine is configured and functions to bring participants to the mansion, rather than to distribute the mansion to the participants which is a technical possibility. A further effect of this coming to the mansion is the articulation of a social body, which concentrates a geographically dispersed membership. The statements of place or location within the assemblage of enunciation work to establish a proximity and location, to demarcate bounded spaces

and situate bodies of individuals in relation to them. The ennunciative machine of locating, or placing, effects arrangements of the elements of content in the MOO and intervenes in the intermeshing between elements in a manner that impacts on their distribution.

Locating statements not only encompass descriptive expressions within the MOO, but are also apparent and active in the conversation/communication exchanges between participants. The proliferation of such communication, often cited as a renewed experience of 'community', belongs equally to the collective assemblage of enunciation. As we saw, Deleuze and Guattari contend that the semantic content of communication is only one dimension and, moreover, that it is indissociable from the implicit presuppositions that mark all speech acts as order-words. Thus, in examining the communication exchanges of the MOO in terms of the assemblage of expression, I am not so much concerned with the content of the numberless conversations and interchanges, as with how the act of conversing, and even what might be described as a certain imperative to converse, intervenes into the contents of the assemblage.

Location or placement are, again, among these effects of the communication exchanges between participants. Firstly, they marks the bodies of participants as members, in a manner that again effects the distribution of bodies I described earlier: the bringing of bodies to the mansion, the distribution of the information machine along these lines of multi-point to point and so on. They also function to distribute the social body along particular lines, that is to define specific social places. Moreover, the frequently asked question in encounters between participants – 'where are you?' – rather than indicating a dispersal of bodies of participants and distances between them, functions as a

statement to effect a proximity between participants. Clearly, it is neither the specific content of the utterance, nor the reply that achieves this; the respondent might be accessing the MOO from another continent. However, implicit in the question is an act that brings discrete and distanced bodies into proximity and connects them. Likewise, location elaborates a concentrated social body across geographical distance. In this way expression effects a particular distribution or arrangement of those bodies, both across space and within a particular place.

If representation is no longer adequate to explain the function of expression within the MOO assemblage, then this clearly problematises claims of subjective transformation based on creative self-determined representation of identity. Not only does language and expression not function in a representative mode, but the position of the subject is also reoriented in relation to expression. For Deleuze and Guattari, the collective assemblage of enunciation is always social and, thus, the subject is not the source of enunciation, nor the subject of enunciation, but rather appears through the operations of the assemblage:

> It becomes clear that the statement is individuated, and enunciation subjectified, only to the extent than an impersonal collective assemblage require it and determines it to be so. (80)

In this thesis I have been pursuing a deliberately anti-subjective account of technology in general and the practices of cyberspace in particular. This requires no lengthy discussion of Deleuze and Guattari's theorization of the processes of subjectivity. However, returning briefly to the discussion on speech and language, it becomes apparent how, in this particular instance, Deleuze and Guattari make the shift from a speaking subject to a collective social assemblage of enunciation. For Deleuze and

Guattari, the collective aspect of the assemblage of enunciation marks its intrinsically social nature.

Every speech act has an implicit presupposition: it effects an action or, in other words, functions as an order-word. If every individual utterance or statement carries with it an implicit presupposition of action, then for Deleuze and Guattari that action is collective in nature and, thus, the collective is implicit in any individual expression of a subject. Massumi explains that every utterance takes place in "a social or institutional context that inflects it with an imperative, however indirectly" (1996:33). The functioning of order words in terms of incorporeal transformation is clearly social. For example in the instance of the 'I do', the transformation effected in the newly united bodies of the husband and wife is social, not simply singular and personal. Indeed as Deleuze and Guattari explain, the 'I do' would not effect those transformations if only one couple were to say it: it is due to its collective iteration that it functions as an order-word. In general the collective or social nature of enunciation is exemplified, for Deleuze and Guattari, in indirect discourse, especially free indirect discourse. This is reported speech, which cannot be attributed to a specific speaker, such as "it is said that". Colebrook explains that such indirect speech places the act of speaking outside of the subject. (1999:130) Thus subjects cannot be considered to be the originators of speech or importantly the instigators of the incorporeal transformations that order-words effect.

In terms of cyberspace such an understanding of the functions of language and speech acts clearly rules out any possibility of subjective transformation through the creation of self-defined textual identities. Rather, I would argue that it demands a consideration of how such expressions function within the collective assemblage of enunciation. When

participants construct physical and personality descriptions of themselves, they are not so much inventing a new identity, as becoming enmeshed in the intersection between enunciation and bodies. That is, such description functions to locate them, arrange them in space, bring them into proximity with other participants who read them and draw them into the population of the social.

The third conceptual roadblock this account of expression averts is that of transcendent structure. To the extent that I have been describing statements effecting actions and order-words propelling incorporeal transformations, it might appear that the assemblage of enunciation acts as a transcendent cause for the machinic assemblage. However, for Deleuze and Guattari, the assemblage of enunciation does not function to determine or construct the bodies of the assemblage in a top-down manner; the relation between the two is one of reciprocal presupposition. Goodchild proposes thinking the point of contact between language and bodies in terms of the event (1996:40). Bodies have attributes, actions and passions that are proper to them. In their meetings and mixings, bodies affect and are affected and this, as we saw in the operation of machinic assemblage, gives rise to particular states of affairs. In the previous chapter, we saw how an event, while it occurred in the meetings of bodies, was not reducible to them, that it had an incorporeal aspect. Deleuze makes use of infinitives to describe this incorporeal aspect of the event and its relation to mixtures of bodies:

> Mixtures in general determine the quantitative and qualitative states of affairs: the dimensions of an ensemble: the red of iron, the green of a tree. But what we mean by "to grow." "to diminish." "to become red," "to become green," "to cut," and "to be cut," etc., is something entirely different. They are no longer states of affairs - but incorporeal events at the surface which are the result of these mixtures. The tree "greens." (Deleuze. 1990:6)

The incorporeal transformations effected by the collective assemblage of enunciation can be considered as events. They intervene in the component bodies of the assemblage and give rise to certain effects, but are immanent to and attributed to those bodies.

On this understanding, the encounter between bodies of participants and the body of mansion within the MOO assemblage can be explained in terms of particular distributions that arise. For example, the bodies of participants come to the mansion and move within the mansion. Statements of location are generated from these encounters, but also work to give those meetings a particular distribution, that is, concentrated not diffused, congregated not dispersed. The body of information intersects with the social body in such a way that produces particular effects, i.e. expulsion, membership, access, competence. In the meeting of the bodies of participants and the information machine a certain proximity is articulated, but this proximity relies on the collective assemblage of enunciation to effect it. That is, individuals at remote computer terminals, through logging into the database of the MOO, are in contact with other individuals. However, it is the expressions or statements that make this a coming together, that transforms remote bodies into bodies capable of sexual encounters or of walking through mansion doors.

How, then, does this account of expression in the MOO assemblage differ from those that understand the MOO as an information-based representation of real life? In the first instance, it does not require disembodiment as an internal condition of the MOO. The expressions of the MOO are not understood as textual representations, descriptions or virtual bodies. They are statements that are real and, moreover, inseparable from bodies in their relations of reciprocal presupposition. Caution must be taken not to conflate the

capacity of expression to affect incorporeal transformation with the idea of effecting transformation through the production of self-defined identities in cyberspace. Incorporeal transformation does concern the transformation of bodies, but it is not generated by subjective choice. Rather, it concerns the effect statements and expressions, as collective or social, have on bodies. Thus, thinking the proliferation of 'language', not as constituting a 'represented' world, but as a moment of social intervention into the bodies that comprise an assemblage, not only circumvents the logic of identity that representation introduces, but also raises the question of power relations. This question of power relations opens onto the other axis of the assemblage, that of territory.

MOO Territories – Order and Becoming

Territory is order, it is the arrival of particular distributions of the component elements of the assemblage. It is a particular set of relations between the enunciative and the machinic, the achievement of a particular consistency. For Deleuze and Guattari, however, the territory itself is not as interesting as the lines that traverse it. Lines of becoming or deterritorialization move toward the outside and carry the assemblage away, whilst correlative lines of reterritorialization recapture the assemblage into a new coherent territory. The territory of an assemblage is not organised by an exterior agent, it is not a pre-given structure into which the elements of an assemblage are slotted and thereby ordered, along the lines of a social constructivist model. Rather, a territory can be thought as the distribution of the components of a particular assemblage that appears in actualisation's of particular events, the arrival of discernible states of affairs and arrangements of bodies and things. As such, while territories are organisations, they are

not a determining infrastructure, but rather remain immanent to the assemblage (1987:142).

In the first two sections of this chapter, I examined what Deleuze and Guattari describe as one axis of the assemblage, the formed content that comprises the machinic assemblage and the formed expression that comprises the collective assemblage of enunciation. These are distinct from each other, but exist in a relation of mutual conditioning. Moreover, the two aspects do not exist in a determining causal relation, but rather attributes arise from connections between bodies which are expressed, and expressions intervene into bodies and effect incorporeal transformations. Deleuze and Guattari see another mechanism as necessary to explain the relation between content and expression within the assemblage, to explain how they are mutually conditioning, but also how they come to be distributed along particular lines and arranged into particular formations; in short, how the form of each content and expression finds its specific configuration within an assemblage. Deleuze and Guattari propose that this arrangement is instigated under the auspices of an 'abstract machine':

> We must arrive at something in the assemblage itself that is still more profound than these sides and can account for both of the forms in presupposition, forms of expression... and forms of content. This is what we call the *abstract machine*, which constitutes and conjugates all of the assemblage's cutting edges of deterritorialization. (1987:141)

For Deleuze and Guattari deterritorialization is inextricable from the territory of an assemblage. I will return to the question of this relation between abstract machines and deterritorialization but in the first instance want to sketch out the general characteristics and mode of operation of abstract machines.

The abstract machine is a machine because it is productive, and abstract because it does not contain matter or signs, but rather pure functions. An abstract machine is diagrammatic – indeed the two terms are often used interchangeably. As a diagram, the abstract machine can be understood as both descriptive of the particular state of affairs within an assemblage and as productive in terms of effecting those distributions:

> We can therefore define the diagram in several different interlocking ways: it is the presentation of the relations between forces unique to a particular formation; it is the distribution of the power to affect and the power to be affected; it is the mixing of non-formalised pure function and unformed pure matter...; it is a transmission or distribution of particular features. (Deleuze 1988: 73/74)

The diagram concerns pure function, the lines of force that traverse multiple and heterogeneous matters and statements, bodies and expressions, and which constitute the particular order of an assemblage, its territory. Deleuze describes Foucault's panopticon in terms of a diagram as a "pure function of imposing a particular taste or conduct on a multiplicity of particular individuals, provided simply that the multiplicity is small in number and space limited and confined" (72). Many different concrete assemblages can belong to the same diagram or be distributed according to same abstract machine: the panopticon, for example, functions across schools, factories, barracks and so on. De Landa offers another example of the functioning of an abstract machine drawn from contemporary science. He describes how sets of equations are used to model systems in terms of trajectories and attractors of phase space.[8] Attractors are general traits governing a system's long-term tendencies, represented as particular points in phase space which direct the trajectories of concrete objects. For example, a ball rolling down a hill will be attracted in every instance toward the lowest point, in which case it is governed by a point attractor. Circular attractors, in contrast, cause trajectories to 'wrap around' (1991:235 n9). The trajectories of many and varied concrete objects might be

directed by the same attractor, which functions as an abstract machine to elaborate particular behaviours and functions:

> For example, a circular attractor represents an "abstract oscillator" which may be physically incarnated in many different forms: a pendulum in a clock, the vibrating strings of a guitar, and the oscillating crystals in radar and radio, digital watches, biological clocks. (236 n9)

A trait or tendency, or pure unformed function, abstract and not concrete, nevertheless causes or orders the behaviour and distribution of formed matter and content. Thus, the attractors function as abstract machines. In this example we can see how abstract machines are causal, in terms of orienting or setting in motion particular itineraries. According to Deleuze and Guattari, abstract machines distribute forms and substances, expressions and contents and 'effectuate' both concrete assemblages and enunciative assemblages (1987:141). However Deleuze insists that abstract machines do not operate along the lines of transcendent causes. Rather:

> the diagram acts as a non-unifying immanent cause that is co-extensive with the whole social field; the abstract machine is like the cause of the concrete assemblages that execute its relations; and these relations between forces take place 'not above' but within the tissue of the assemblages they produce. (1988:37)

With their mixtures of bodies and events of incorporeal transformation assemblages achieve specific consistencies through the instantiation of a diagram. The abstract machine is a set of relations that must be actualised in the states of affairs, bodies and things. For example the attractor, as abstract machine, cannot be found outside of the phase space described by the trajectories of the objects within which it operates. Thus, the abstract machine of the attractor cannot be described as an external cause of the distribution of trajectories, but remains immanent to those trajectories; outside of the

trajectory propelled by the momentum and mass of a formed matter, the abstract machine of the attractor has no functional existence. In so far as it describes a pure function, it must be actualised within the forces and matters of the concrete contents and expressions of an assemblage.

Thus, within a particular assemblage, it is possible to discern a diagram that can explain the particular arrangement of an assemblage, that is, disclose its territory. In the instance of the MOO, the diagram would explain why, for example, the participants go to the mansion and not the mansion to the participants, why proximity and identifiable location predominate over dispersion and diffusion. In these terms, the pure function of the MOO, the territory it encapsulates, might be described as one of gathering dispersed entities into a proximate space. I have considered how such a function would traverse the various meetings of bodies in the assemblage, as well as the incorporeal transformations effected by the collective assemblage of enunciation. It is the elaboration of a territory, not to be thought of as a terrestrial spatial area, but rather as a consistency and coherence, that stabilises the multiple and differing component bodies of the assemblage and regulates their encounters. Thus, for example, in the case of multiplicity of bodies of participants, it is a question of regulating the connections and linkages with the other bodies of the MOO assemblage – information, social, the mansion, and so on – such that bodies find a particular articulation, which functions to 'place' them. I described earlier how both the operations of the machinic connections of the concrete assemblage and the incorporeal transformations effected by the assemblage of enunciation enact this function, how it is immanent to them and arises from the field of their connections and intermeshing. However, it is also apparent that this is just one of an infinite range of potential arrangements that might be actualised. It

is the diagram that offers an explanation of the appearance of this particular state of affairs. Massumi describes the diagram, or abstract machine, as a synthesizer, a machine for connecting in particular ways, which elaborate particular territories (1996:47).

For Deleuze and Guattari, abstract machines are closely tied to the movements of deterritorialization, the cutting edges of the assemblages. One way of explaining this affinity between abstract machines and deterritorialization is that, to the extent that abstract machines are unformed matter-function, they have already deterritorialized the particular forms of content and expression effectuated by them. That is, the unformed matter-function of a diagram, while it is actualised within concrete assemblages, also extracts from those forms the unformed matter and functions. The diagram "tears from forms particles between which there are now only relationships of speed and slowness" (Deleuze and Parnet 1987:130). Thus, in abstracting functions and matters, a diagram deterritorializes at the same moment that it functions to order and organise. In this manner deterritorialization is always operational within every territory. Lines of disintegration and deaggregation are implicit in the integrations and aggregations that constitute the territory of every assemblage.

For Deleuze and Guattari every deterritorialization is accompanied by a correlative re-territorialization. That is, while the lines of deterritorialization are constituted through the abstract machine, they are also organised by it in a movement of reterritorialization. To account for this double movement, Deleuze and Guattari describe two different types of abstract machines: abstract overcoding machines, which reterritorialize; and abstract mutating machines, which deterritorialize. The two are inseparable in assemblages:

> there is no dualism between abstract overcoding machines and abstract machines of mutation: the later find themselves segmentarized, organised, overcoded by the others, at the same time they undermine them: both work with each other at the heart of the assemblage. (Deleuze & Parnet 1987. 132)

Every deterritorialization is accompanied by a correlative reterritorialization, that is, the arrival of a new diagram, which elaborates a new order. The rape incident in LambdaMOO can be described in these terms. Dibble's account explained how this event precipitated a change in the MOO, a moment when ordered community emerged, when sanctions were formalised and mechanisms of regulation set in place. We can read this event as one, not of a fixed structure evolving to deal with novel circumstances, nor of a virtual world adopting the social and legal frameworks of the 'real world', but rather as an instance where a deterritorialization carried the assemblage away and a subsequent reterritorialization occurred. Thus, in the event of the rape, the information machine and the bodies of certain participants were drawn along a line of deterritorialization, that is, connected in different ways that escaped the existing arrangement of bodies and expressions within the MOO. The body of the social was cut, the bodies of participants were grasped by new forces, the body of information followed new itineraries and the whole assemblage was carried away. Following the event there was a realignment, a reordering of the various components of the MOO, a reterritorialization. The new assemblage of LambdaMOO was discernibly different from the previous: the body of the social ordered in new ways, connections between the social and the information machine reordered and so on.

There is no utopia toward which deterritorialization progresses: indeed Deleuze and Guattari warn that caution must be observed in disaggregating and destratifing (1987:503). This lack of a final liberatory destination does not, however, undermine the

transformative possibilities of assemblages. Rather, it relieves them of teleology and, as such, elaborates an open ended conceptual horizon, which I have been arguing is essential to any transformational process. In the actualisation of new states of affairs, bodies and things, in the movement toward the outside of lines of deterritorialization in assemblages, in the becomings of multiplicities, we can see a creative movement of differing in kind with unpredictable destinations.

Understood as an assemblage, a very different picture emerges of the practices and entities of the MOO from the accounts of it as a disembodied social space, inhabited by virtual bodies that represent participants from the 'real' world. As an assemblage, I have argued, the MOO is not a disembodied space, nor is it populated by 'representations'. Rather, it is a meshwork of bodies, signs, energies and flows which elaborates a particular territory, but which always remains open to new connections that carry the assemblage away into new configurations. I have been able to provide only a broad sketch of the various components of the MOO assemblage, partly due to space limitations, but mainly because my principal concern has been to illustrate the conceptual shifts that underpin the model of assemblage. These shifts will allow an account of the operations and functions of the MOO assemblage, which displaces the problematic logic of identity. The benefits for feminists of adopting this approach are twofold: firstly, in displacing the logic of identity, the possibility of apprehending difference in kind, including sexual difference, emerges; secondly, in elaborating an open ended conceptual horizon, the possibility of radical transformation appears. In the next chapter, I will conclude by considering in more general terms the conceptual shift that underpins these two movements and will explore in more detail the implications of this shift for feminist theorists of technology in general and of cyberspace in particular.

[1] MUD Object Oriented - MOO is a variation of the MUD – a Multi-Participant Domain. The MOO differs in that participants are able to construct various objects and build onto the MOO.

[2] See Hayles (1999) *How We Became Posthuman : Virtual Bodies in Cybernetics, Literature, and Informatics*, for a detailed overview of the various theoretical and scientific accounts of the status of information.

[3] This is a very well known incident which has given rise to a range of articles and commentaries of which Dibbell's was the first and most widely known. The incident concerned a group of college students who wrote code which allowed them to take control of other figures in the MOO and which they used to compel them to perform acts of sexual violence against others and themselves.

[4] For a detailed history of the development and deployment of the internet see Manuel DeLanda (1991) *War in the Age of the Intelligent Machine*. DeLanda traces how technological, strategic and logistical concerns were part of the motivation for the military to develop a distributed communication network. Kitchen (2000) *Cyberspace: The World in the Wires*, gives an overview of the development of computer technology up to and including the networked systems of the internet. Feminists have also been investigating these developments with a view to uncovering the role women played in the emergence of computing technology and culture – see Sadie Plant (1998) *Zero's and Ones*.

[5] Accounts of cybersex have most often formulated an imaginary link between 'real' and 'virtual' bodies. See for example Sue-Ellen Case (1999) *The Hod Rod Bodies of Cybersex* and Juniper Wiley (1999) *'NO BODY is "Doing It": Cybersexuality*.

[6] Hugh Tomlinson and Barbara Habberjam note in their Translator's Introduction to Deleuze & Parnet's *Dialoges* that the term *mot d'odre* literally means 'word of order', but that that usual translation is 'slogan'. They state that "Professor Deleuze wanted a translation which highlighted the relationship to the word, or at least to language (as in *mot de passe* [password]) (1987:xiii)." Brian Massumi also notes that order-word has a twofold meaning: "order should be taken in both senses: the statement gives an order (commands) and establishes an order (positions bodies in a force field) (1996:31)."

[7] Interestingly, Deleuze in his *Postscript on Control Societies* sees that the 'control societies' which now replace disciplinary societies are characterised, not by the confinement of bodies, but by electronic monitoring and surveillance of mobile bodies as a mechanism to locate and thus order them (1995:181/182).

[8] Phase space is an abstract space with as many dimensions as degrees of freedom possessed by a system. A degree of freedom is the possible trajectories which a system is capable of. De Landa gives the example of an oven, a portrait of which would after discarding all 'irrelevant details' would consider only the aspect that 'matters' – temperature – thus one degree of freedom. A map of the phase space of the oven system then would be one dimension – a line (1991:234).

Chapter 7

Rhizomatics and Feminism

Given that it is impossible to ignore binarised or dichotomous thought, and yet given that such theoretical paradigms and methodologies are deeply implicated in regimes of oppression and social subordination – of which the oppression of women is the starkest – any set of procedures, including rhizomatics, which seeks to problematise and render them anachronistic may well be worth closer feminist inspection.

Elizabeth Grosz. *A Thousand Tiny Sexes: Feminism and Rhizomatics*

This thesis began with the question of the possibilities cyberspace might open for feminism's transformational aspirations. It has followed some of the many complex lines of inquiry that converge in this question: the status of technology, the relation between technology and man, man and woman, technology and woman, technologies and bodies, difference and identity, knowledge and transformation. A picture emerged in the first four chapters of the difficulties involved in adequately theorising technologically-driven transformation, due to the persistence and ubiquity of an epistemological framework ordered by an exclusionary logic of identity which forecloses the possibility of radical change. In chapters one and two, I examined the ways in which prevailing epistemological structures and modes of knowledge determine how technology is understood and, moreover, how man himself is conceptualised. In chapter three, following Irigaray, I demonstrated that this is problematic for feminists in so far as the logic of identity, through which man is articulated, is incapable of acknowledging sexual difference as an irreducible difference in kind. Further, I argued that models of technology, which do not adequately take account of the operations of such structures, are ultimately unable to sustain claims to be radically transformative. In chapter four, a survey of the discourses surrounding the technological and social realms of cyberspace found these same difficulties consistently reiterated, such that the transformative expectations feminists and others hold for cyberspace become difficult to support. From these analyses, it became clear that in order to approach the question of cyberspace and transformation, an alternative conceptual framework is required, which can apprehend difference other than in terms of the same and which is open ended and capable of accepting novelty and change. In the final two chapters, I examined the possibilities Deleuze and Guattari offer in terms of elaborating such a conceptual

horizon. I oriented my excursion into their complex and idiosyncratic body of work around the concept of assemblage, in the first instance as a way of reframing an approach to the intersection of bodies with technologies. However, as with all the concepts they develop, an understanding or deployment of the notion of assemblage necessarily opens onto other key interrelated concepts, including difference, multiplicity, becoming, event, virtual and actual. I have argued that these together elaborate a theoretical horizon not grounded on identity. In this concluding chapter I want to recap the broad parameters of the shift a Deleuzian conceptual horizon facilitates, note how approaches to theorising cyberspace are reframed within that field, and finally sketch out the broader implication of such a reorientation for feminists theorising technology.

Shifting Horizons – Rhizomatics

Over the last ten years, feminist thought has witnessed a gradual growth of interest in Deleuze and Guattari. This thesis has not been a feminist assessment of their corpus, a task that has been taken up and well documented elsewhere.[1] Rather, I have concentrated on examining their conceptual tool kit, loosely described as rhizomatics, as a response to a particular instance of theoretical difficulty, that of technology and transformation. This wide-ranging and complex task escalated from an examination of technology to questions of knowledge and epistemology. In order to pursue my initial inquiry, it became apparent that an engagement with these broader questions would be unavoidable, thus necessitating a move beyond any single concept toward an examination of the wider theoretical frameworks within which specific concepts are generated and function. I have argued that Deleuze and Guattari develop a conceptual horizon that effects a significant theoretical shift and I have suggested that this shift

might prove productive for feminists. In the previous two chapters, I examined how their various concepts allowed an understanding of bodies, technologies and a particular cyberspace assemblage which avoided the difficulties of binary opposition and the logic of identity. In concluding, I want to situate this analysis in the context of what Hardt identifies as the general theoretical shift that underpins Deleuze's (and Guattari's) varied projects:

> to the negative movement of determination he opposes the positive movement of difference ... Against a transcendental foundation we find an immanent one; against a given, teleological foundation we find a material, open one.
> (1993:xiv -xv)

This tripartite shift is apparent in Deleuze and Guattari's description of their approach as rhizomatic.

In the introduction to *A Thousand Plateaus* they describe various conceptual formations and structures that proceed by way of negative determination, transcendence and teleology and contrast these to the positive, immanent and open nature of the rhizome. [2] The first of their shifts, from a negative movement of determination to a positive movement of difference, has been of central concern to this project. As we have seen the logic of identity offers an exemplary instance of the negative movement of determination, whereby identity is constituted through the negative determination of difference as difference of degree. Deleuze and Guattari offer a concise critique of this mode of determination, through which a negative movement of determination of difference underwrites the logic of identity, in response to which they propose the concept of the rhizome. The rhizome, they contend, proceeds by way of multiplicities

and, as such, does not determine identity negatively, but rather allows the apprehension of the positive movement of difference as difference in kind:

> Unlike a [tree-root] structure, which is defined by a set of points and positions, with binary relations between the points and biunivocal relationships between the positions, the rhizome is made only of lines: lines of segmentarity and stratification as its dimensions, and the line of flight or deterritorialization as the maximum dimension after which the multiplicity undergoes metamorphosis, changes in nature. (1987:21)

As we have seen, the straightforward binary pair is clearly founded on a negative movement of determination, where things are articulated in terms of their difference from the original in terms of divergence, similarity, lack or absence. In theoretical formulations of cyberspace, this movement can be discerned in the positing of cyberspace as a 'virtual reality' in contrast to a 'real world'. Even though the virtual is understood to be at variance with the 'real world', that is, more than an exact copy, it remains determined negatively in relation to the 'real world', where it is apprehended in terms of its degree of divergence, or similitude, to that world. 'Virtual reality' has no positive articulation in itself.

Beyond the straightforward binary pair, Deleuze and Guattari find a movement of negative determination in the formulation of the multiple, where multiples remain articulated in relation to a central unity or origin. As we saw in chapter five this notion of multiplicity is comprised of aggregates of One, and thus fails to apprehend difference as positive, since multiples are only ever accounted for in terms of the original unity of the One. In formulations of cyberspace, the prosthetic conception of technology/body interactions proceeds along these lines. Technologies are added to the human and give rise to a profusion of new forms and configurations but, in so far as the human, or the

human body, is the stable origin of these encounters, any subsequent form is understood in terms of a variation from it. Thus, the multiple technology/body configurations that ensue are tied to a central origin – the human body as self-identical and unified – in relation to which all emergent formations are determined negatively.

Deleuze and Guattari identify one other configuration of multiplicity that proceeds by negative determination, one in which there appears to be no central origin, just a proliferation of points. They cite as an example of this formulation, literary modernist attempts to fragment the unified text of the book (12). However fragmented and dispersed such systems appear, Deleuze and Guattari contend that they do not achieve a multiplicity based on positive difference, but rather merely instigate a 'deep structure' that reiterates unity in another register. The proliferation of fragmented elements are transposed into a unifying totality. This unification occurs through an operation of overcoding, which proceeds through a negative determination of difference. A field of differences between seemingly autonomous parts is ordered and articulated through their relation to the whole, the unity. The parts are supplemented by overcoding, which integrates them into the whole. Their difference is determined as a lack, which must then be supplemented. In terms of cyberspace, we can see this structure in operation in the framing of cyberspace within a totality of information space, where information functions to overcode. Disparate bodies, consciousness and objects are here overcoded as information and, on that basis, integrated into the whole. As we saw in chapter four, each of these parts is understood in terms of information, its compatibility in the case of consciousnesses, or its incompatibility and subsequent need for overcoding, or translation, in the case of bodies. In each instance, the totality of information space

elaborates, across the heterogeneous parts, relations of difference determined negatively in terms of their compatibility or discrepancy.

These three modes of ordering relations between constituent parts, centres and wholes clearly demonstrate how difference is negatively determined within the logic of identity. Across all three, identity is attributed according to a relation of difference *from* either a central unity or a totalising unified whole. As we saw in chapter five, for Deleuze and Guattari this notion of foundational unity is at the heart of a model of the multiple incapable of recognising positively articulated difference in kind (32). Within such formulations the multiple is always thought in strictly numerical terms, in a binary relation of 1/-1, or in the biunivocal 1+1, that is, as combinations and accretions of ones. Both rest on the unity and centrality of the one and, in both instances, difference is determined negatively in relation to the one. As the basis of the rhizome, Deleuze and Guattari draw on another model of multiplicity, which has "neither subject nor object only determinations, magnitudes, and dimensions that cannot increase in number without the multiplicity changing in nature" (8). Such a multiplicity does not rest on the unity of one, as merely quantitative magnifications of that one, but is substantive in its own right. Moreover, because such multiplicities are intensive rather than extensive, any change is a change in nature. Thus, the multiplicity of the rhizome is of the order of difference in kind, rather than difference of magnitude or degree and, as such, does not proceed by way of a negative determination of difference.

This model of multiplicity underpins the four characteristics of the rhizome Grosz describes: connectivity, heterogeneity, rupture and cartography (1994:199/200). A rhizomatic approach to thinking cyberspace, by drawing on these characteristics, offers a

very different understanding from those I critiqued in chapter four. Firstly, it suggests that cyberspaces are not 'products' of, and thus determined by, particular technologies or particular representations, but rather that they can be understood as fields of connection between disparate and heterogeneous elements, bodies, wires, switches, chips, coded formations, geographical distributions and so on. In doing so, no single element – such as information (or information technology) – is necessarily positioned as determining, and so any element might connect with any other to give rise to something unexpected. Given such an understanding, the elements in themselves are not fixed and eternal entities but equally capable of change. This not only avoids installing a logic of identity as the basis for all subsequent understandings of cyberspaces, and positioning technologies in a prosthetic relation, but also opens up the possibility of new and creative connections within which elements differ and become something else. Thus new arrangements of technologies, bodies, objects, codes, and spaces might well give rise to new articulations of each of these elements, that is, a change in nature. This continual movement toward new connections and linkages requires a cartography, a map-making, which follows these lines into unexpected and unpredictable configurations. For Deleuze and Guattari, mapping is incompatible with representation, or tracing, which they see as concerned with integrating such lines into existing structures or paradigms (1987:21).

The rhizome characterised by connection, heterogeneity and the movement of differing multiplicities is that which must be mapped, not traced. In this aspect, the second theoretical shift identified by Hardt, the movement away from transcendental in favour of immanent foundations, is apparent. According to Deleuze and Guattari, binary and biunivocal structures operate as a transcendent foundation, that is, they remain external

to their constituent components and are not altered by any alteration within those components. The starkest example of this is the instance of determination to which Deleuze and Guattari refer as 'deep structure', where the absent but invoked totality functions as a unified and unifying ground. Likewise, in the instance of the binary dichotomies, a unified identity functions as the locus for differentiating and, thus, stands above the field of differences that are articulated in their difference from it, but at no point impinge on it. Structuring logics such as that of identity remain external to the objects and subjects, which are articulated through them, and remain unaltered as subjects and objects arise, mutate and disappear. The structure endures and transcends its constituent parts.

Representation is implicit in the notion of transcendental foundations in so far as it operates as a 'tracing' or an overcoding (12). As objects and subjects are articulated and organised in various modes around unity, they acquire an identity through the positions and points they come to occupy within that formation. For example, in the case of the pattern of binary opposition, an element finds a determination in relation to a unified origin from which it is a divergence. Within the total field of a deep structure, the overarching totality overcodes each constituent element. Overcoding in such structures describes the process whereby an object or subject is taken as a reflection of an original, or becomes articulated in terms of a totality within which it is positioned. Along both lines a movement of representation takes place based on a notion of unity or identity and distance from, or relation to, that unity. This is the space of overcoding, a gap between the supposed essence of a thing and the points, positions, meanings and determinations attributed to it by a structure that transcends it. The movement of overcoding implies a foundation that is at once distinct from the objects themselves and

moves to determine them from without thrc gh the attribution of a supplementary representation.

Deleuze and Guattari consider the rhizome, as immanent, to be of an entirely different order:

> Unity always operates in an empty dimension supplementary to that of the system considered (overcoding). The point is that a rhizome or a multiplicity never allows itself to be overcoded, never has available a supplementary dimension over and above its number of lines, that is, over and above the multiplicity of numbers attached to those lines. All multiplicities are flat, in the sense that they fill or occupy all of their dimensions: we will therefore speak of a *plane of consistency* of multiplicities, even though the dimensions of this "plane" increase with the number of connections that are made on it. (8/9)

The concept of immanence is crucial to the challenge Deleuze and Guattari make to the regime of representation. Within an intensive multiplicity, all parts are strictly immanent and are not determined in relation to a transcendent organising principle such as unity. As such, there is no longer the space between the 'essential thing' and the 'external structure' within which overcoding occurs. On this immanent plane, connections are made directly between different elements neither demarcated nor governed along lines dictated by a closed transcendent system. Heterogeneous elements encounter each other in an immanent field so that no one component is privileged or determining. These connections are of the order or exteriority, that is, they are not the meeting of one interiorised, unified and self-referencing body (of discourse, signs, practices, subjects) with another, in which one predominates in a hierarchical and structuring manner. Rather, there are only the connections made on a single plane of consistency or exteriority. Thus, the multiplicity or the rhizome is not a transcendent structure generating representation via the distribution of one and its multiples, but

rather a field of movement and connection, of differing and becoming, an event. Cartography follows the itinerary of such events, mapping the lines of connection and movements of differing, rather than integrating them into a structure of representation which fixes objects and relations by tracing and overcoding them.

In terms of rethinking cyberspace this is an important shift in approach: it displaces the logic of identity, reiterated via representation, as the frame through which accounts of cyberspace are elaborated. In the previous chapter, I demonstrated that taking up this concept of immanence yields a very different understanding of cyberspace. For example, the textual aspects of the MOO assemblage are not taken as signifying or representing some 'real world' referent, but rather they are explicable as elements of an assemblage of enunciation, which is immanent to the machinic components of the assemblage. They do not represent an information or communication structure based on representation, into which the machinic elements of the assemblage are integrated, but rather are immanent to those elements and connect with and intervene into them. I also claimed that such statements and semiotic regimes appear only in the events, connections and interminglings that traverse assemblages, and not prior to them. This refusal of the prevalent notion of cyberspace as a representational information space, I argued, is a crucial step toward theorising cyberspace other than through the logic of identity. Taking up such an approach reorients analysis of the function of conceptual structures, like the binary opposition within cyberspaces, such that they are assessed in terms of how they function with particular assemblages, as active connected elements rather than transcendent ordering principles.[3]

The third shift Hardt discerns, open-endedness rather than teleology, is also apparent in the rhizome. The movement of connection and differing of intensive multiplicities is clearly incompatible with teleology. Teleology in binary and biunivocal systems is insinuated through transcendent foundations, which function as a determining structure and, as such, delimit and circumscribe the articulation of objects and subjects within these formations. Parts are integrated into the whole, changes in parts do not alter the whole. By contrast, the rhizome with its constitutive immanence and multiplicity, is an open field wherein the connections made between component elements follow singular and unpredictable lines. Each change is a change in nature, which is unpredictable in so far as the parts constitute an immanent whole, which itself changes in nature every time a constituent part differs. For Deleuze and Guattari, a rhizome does not produce determining structures, but is made up of plateaus, or zones of consistency, which are:

> Continuous, self-vibrating regions of intensities whose development avoids any orientation towards a culmination point or external end. (22)

I would argue that this refusal of teleology and the elaboration of an open-ended conceptual horizon is crucial to any transformational undertaking. Moreover, because the concept of assemblage is informed by these shifts it offers just such an open-ended model. Firstly, since assemblages are intensive multiplicities in which any change is a change in kind, an assemblage is animated by the movement of difference in kind and, as such, its elements are not determined negatively through a transcendent structure or foundation. Secondly, for Deleuze and Guattari, assemblages are strictly immanent and are not overcoded within a determining representational structure. Finally, as there is no transcendent determining structure governing the events of assemblage, there is no founding teleology in operation. Assemblages are traversed by the movements of

differing and, as such, are not foreclosed by any structural unity or totality, but are open to new connections that give rise to unexpected and unpredictable configurations. It is on this basis, I have claimed, that the model of assemblage, and the conceptual shift which underpins it, offers an approach to theorising the formations and practices of cyberspace which does not shut down the possibilities of transformation within a closed loop of identity.

Assembling Cyberspaces and Cyberbodies

Clearly, theorizing cyberspace through Deleuze and Guattari's rhizomatic conceptual field gives rise to a very different understanding from that elaborated through the binary logic of identity. There are a number of key points, at which these understandings diverge, which have implications for feminist transformative expectations. In the first instance, cyberspace as a 'virtual' reality as opposed to a 'real' reality is unsustainable in Deleuzian terms. While Deleuze develops a very different concept of the virtual, what is significant here is, not the disparity between understandings of the virtual, but rather the formulation of the relation of 'virtual' to the 'real' world in the discourses of cyberspace. As we saw in chapter four, 'virtual reality' is figured in terms of a simulation, representation, copy or informational translation of a 'real' world. It is determined negatively in its difference or divergence from the 'real' world. A Deleuzian understanding of cyberspace refuses such a determining relation, as well as the binary distinction virtual/real which underpins it. Instead, it insists that cyberspaces are real in and of themselves and possessed of their own characteristics and attributes, energies and forces, practices and arrangements.

For feminists theorising transformation, this implies that cyberspaces cannot be dismissed as merely 'virtual' and thus as spaces, places or practices where relations of power are insignificant. In so far as cyberspaces are actual and thus possessed of their own reality, transformative claims based on the notion of cyberspace as an initially free and extra-social space cannot be sustained. Such claims seek transformation through devising alternative representations of self, sexual identity, and community, made possible because the normalising representations of the 'real' world, once detached from their material carriers – bodies – can be manipulated as pure constructs of information. This formulation rests on a particular model of representation as at a remove from the object it represents. Deleuze rejects this understanding and, as we saw in chapter five, shows how discourse, signs, semiotic regimes and speech acts intervene in and are inseparable from the attributes and actions of the machinic elements of an assemblage. As such, they are never beyond the matrices of power and knowledge, but rather intersect with them constantly in the events of assemblage. Cyberspace is not a blank page on which individuals might freely write transformed representations of self and community. Rather, the prominence of representation in transformative accounts of cyberspace points to the operations of broader discourses of information which belong to a particular formulation of knowledge. (Hayles 1999)

Understood in terms of an assemblage, cyberspaces are not irretrievably ordered by any overarching transcendent structure. Thus, while the technologies of cyberspace may well be the offspring of a patriarchal military-industrial complex, they are not in any essential way governed or determined by them. This is not to say that such relations of power and interest are not active within cyberspace, but it is to reposition those relations such that, while they are functional and may indeed order and arrange cyber-

assemblages along particular lines, they are not unchanging transcendent structures. Rather, as elements of an assemblage, relations of power are open to change and alteration and subject to differing. In this manner, while particular dominant configurations of power might be in operation, cyberspace itself is not foreclosed to the possibility of being otherwise, so that any manner of change, innovation and transformation remains possible.

Thus, an approach to cyberspace emerges in which it is not negatively determined by its difference from 'real' space and but is possessed of its own positively articulated attributes and formations. The refusal of a determining binary logic equally displaces the understanding of cyberspace as formulated through a transcendent order of information/matter. Information is no longer the central organising principal to which matter is subordinate, but rather must be considered in terms of how information technologies and the circulation of information encounter and engage immanently with other elements of a cyberspace assemblage. By displacing the determinism of the logic of identity and refusing transcendent structures, cyberspace becomes a field of different practices, events, configurations and connections, which are not determined in advance and are thus open to the possibility of invention, novelty and the emergence of new, radically transformed formations. Moreover, in so far as cyberspaces are understood to be possessed of their own reality, transformation is not simply contained in or restricted to a 'virtual' realm, with no effect in the 'real' world. Rather, the connections and linkages which occur in the events constituting cyberspace assemblages might indeed be movements of transformation.

Given such a reformulation of cyberspace, the understanding of embodiment and cyberspace is also reformulated. Throughout my consideration of cyberspaces I have focused on the understandings of bodies elaborated in various accounts, as a means to assess how irreducible difference in kind is apprehended. I found that a mind/body structure was consistently elaborated in alignment with a pervasive information/matter opposition. Theorising cyberspaces through a Deleuze and Guattarian conceptual field clearly recasts these formations. If cyberspaces, thought as assemblages, are no longer ordered by an exclusionary opposition between information and matter, the mind/body dichotomy is also displaced. On this understanding, bodies are in no way excluded as elements in cyberspace assemblages, as in the scenarios of disembodied consciousness. Indeed for Deleuze, bodies are in no way subordinated to consciousness. Colebrook and Bray make this point convincingly in their critique of the notion that the relation between body and mind is mediated through a 'body image'. Such a formulation, where a 'body image' is a representation of the body to and by consciousness, they argue, is clearly based on a mind/body split. They suggest that Deleuze offers an alternative to this understanding in which "the body is not a prior fullness, anteriority, or plenitude that is subsequently identified and organised through restrictive representations" (1998:39). They argue that Deleuze reformulates representation and shifts it to the same level as other bodily events, forces and activities (43), thus allowing for a very different understanding of the status of bodies and their relation to the information and textual elements in cyberspace assemblages.

Cyberspaces as assemblages are traversed by events which traverse each element equally, including bodies. As such, these assemblages are the scene of particular events of embodiment that assemble or actualise particular cyber-bodies. A body in a MOO

assemblage is a specific set of practices and comportments, signs and actions, not a representation of an absent 'real' body. That bodies in the MOO are comprised in part of textual elements does not necessarily install an information/matter, virtual/real structure. I would suggest that the textual forms do not function to represent real bodies, but rather that, in a Deleuzian sense, textual description functions as an active element in an assembled MOO-body. They function in the manner of the enunciative aspect of the assemblage, inseparable from and immanent to the machinic elements and the event of assembling. Textual elements can thus be read as functioning in particular ways in terms of the assembling of bodies as components of a larger MOO-assemblage. They function as particular and specific modes of display or self-presentation, adornment, modes of locating, orientation, occupancy and inhabitation, and fields of encounter with other MOO-bodies. Textual elements are not a 'virtual body' or representation but a practice in which a specific set of capacities, energies and actions are in play. These textual elements are components of a particular actualisation of a body whose forms, contours, paths of sensation, energy and activity are assembled in the connections made with the other elements of a MOO-assemblage. This MOO-body appears with a field of connection to the screens, keyboards, phone lines, electrical currents, servers, software, program architecture, communication protocols, which are equally impacted by the actions and activities of the body, the flow of kinetic energy across keyboards, the speeds of response, the span of attention, the disposition in time and so on.

I would argue, then, that cyberspaces are in no way disembodied, but rather that specific and particular bodies arise within a cyberspace assemblage. The capacities and forces of bodies actively shape such assemblages in a creative and productive manner. This is not

to suggest that cyber-bodies are automatically liberated. The ordering and managing of bodies remains, as Foucault argued, an active site of the operations of power. Moreover, as we saw in the previous chapter, assemblages are traversed by power relations, which impact directly on their configuration and operation and the particular articulation of their component elements. Indeed, Deleuze suggests that a new diagram of 'control' is emerging to order emergent information technology-bodily formations (1995). However, in that Deleuze and Guattari reorient the operations of power in terms of an operational diagram, it becomes immanent to an assemblage, not transcendent and thus not closed. The dominant relations of power/knowledge are therefore never stable or eternal: as functional elements of an assemblage they are open to becoming other in shifting fields of connection. While they may be ordered and arranged in particular ways, in so far as they can forge new connections, draw on different capacities and do different things, cyber-bodies remain open to becoming otherwise. Transformation in cyberspace, then, cannot be achieved through the excision of bodies, or through the self-representations of consciousness. Rather, it is the capacity of bodies to make connections with other bodies – of information, technology, objects and formations – on an immanent plane, that endows cyberspace assemblages with the potential for transformation.

Feminism, Technology and Transformation

Clearly, shifting to Deleuze and Guattari's conceptual horizon entails a significant reassessment of the tasks and methodologies of feminism. Exploring the full implications of their concepts for feminism is beyond the scope of this thesis, though a task which a number of feminist thinkers have begun and doubtless a site of much future activity. By way of concluding, I want to return to the central concern of the thesis, that

is, feminist theorising of the transformative possibilities of technology, and begin to draw out the implications of a Deleuzian approach for this set of questions, relations, concerns and expectations. I would suggest that there are three immediate points of impact: firstly, the understanding of the relation between masculinity and technology; secondly, the formulation of woman; and thirdly, the project of transformation.

I have argued that accounts of technology as masculine culture remain limited, to the extent that they are articulated through a conceptual framework of identity which positions both technologies and woman as objects determined in relation to man. The prosthetic model of engagement with technology, and the analyses of various practices whereby technology and masculinity are aligned are all theorised on this basis. Within such a framework, the possibility of technologically-propelled transformation is curtailed because technology can be thought only within these determining parameters. To think technology other than through the logic of identity, in terms of a Deleuzian assemblage, necessitates a reassessment of the relation between technology and masculinity, in which no necessary affinity is assumed between them. Masculinity cannot be taken unproblematically as a dominant position or structure that orders technologies, as well as ordering men and, by extension, women. While such a reorientation derives from the immanent nature of the assemblage, it also arises from a very different understanding of the functioning of power within assemblages.

Deleuze and Guattari take up Foucault's notion of power as operational, rather than a thing possessed by a class or subject and then invested in or appended to objects including technologies. Conceived thus, power is immanent to the articulation and configuration of the technological, as well as to the intersections of technological

apparatus with other objects and bodies. This formulation is apparent in Foucault's account of the diffusion of power across the soldier-body-rifle connection, examined in chapter two. The connection and mode of linkage between the two is a point at which power is operational and where it effects a distribution of the two in time and space (Foucault 1977a:153). Deleuze explains the operations of power within assemblages in terms of diagrams or abstract machines. Diagrams, as functional relations, intervene in the operations of assemblages, to effect certain distributions of components within an assemblage, from a position immanent to the assemblage, not as a transcendent structure that determines the assemblage from outside. Particular orders and hierarchies, for Deleuze and Guattari, are elaborated and congealed within strata. Assemblages are integrated to varying degrees into strata through the operations of diagrams (or abstract machines). For Deleuze and Guattari, the appearance of particular orders and relations of power within an assemblage is related to how stratified any given assemblage is at any moment. This is not to position these strata as transcendental and determinant. In so far as they arise from connections and linkages and establish their own specific territories, assemblages are not contained within or determined in advance by any particular order. In keeping with a general refusal of transcendent structure, and given this understanding of power as operational, Deleuze insists that, although the forces of stratification intervene into assemblages, they do so only in an immanent manner, as a diagram or abstract machine.

Deleuze and Guattari devote a great deal of effort to analysing, or undertaking a cartography of, the various processes of stratification through which power and knowledge traverse everyday assemblages of objects and practices.[4] My focus here has not been to investigate the various strata into which cyberspace is more or less

integrated in contemporary practice but rather to explore the range of strategies and concepts Deleuze and Guattari offer to undertake this large and complex task. I have argued that feminists need to find a theoretical approach that is not contained within the deterministic logic of identity. Only then will it become possible to account for the everyday operations of power-knowledge other than within a framework bound by transcendence and teleology or, in other words, to think multiplicity, difference and open-endedness without foregoing a detailed account of the tangible operations of power. For feminists, such a mapping would consider the forms and functions of men, women and technologies that arise in particular assemblages so as to discern the specific operations and relations of power and any resultant hierarchical distribution, rather than beginning from the assumption that power is at the disposal of the masculine.

As we saw in chapter one, masculinity as a gendered identity is a crucial plank in social constructivist theorizing of the relations between men, women and technology. It functions, along with femininity, to avoid any recourse to essentialism and to shift the focus toward the operations of social institutions, practices and discourses as the site of the configuration of relations to the technological. In chapters three and four, I explored at some length how thinking technology and cyberspace through the concept of gender had relied on, if not actively installed, a logic of identity, and therefore, could not adequately think the transformative possibilities of technology. Indeed, as Colebrook and Bray argued, the concept of gender itself, to the extent that it is understood as a (social) representation of women and men appended to or inscribed upon some authentic object (the body) outside of representation, is difficult to sustain within a Deleuzian horizon (1998:42). As we have seen, this formulation of representation belongs to the movement of negative determination and transcendent structure, which cannot account

for difference as positive and active and is clearly at odds with the concept of immanence. As they explain in their critique of conventional accounts of anorexia, thinking the condition through a concept of immanence, rather than within a framework of representation in which it is explained in terms of 'body images', opens up a space for the emergence of new formations:

> The ascription of creativity, positivity, or activity to different bodily practices avoids the positing of any primary explanandum (such as representation) of which these practices would be effects. (59)

If bodily practices are thought in their own terms as creative and positive, rather than explained through a deterministic framework of representation, such as that of gender, then the field of connections, in which the actions, energies and activities of bodies encounter those of other entities and objects, including the technological, becomes a site for the emergence of new and different bodies. Gender, to the extent that it is elaborated through the framework of representation and thus unable to accommodate the possibility of such becomings, must be displaced as the explanatory nexus for the relations between social formations, men, women and technology. Displacing gender does not mean that feminism cannot offer an account of social configurations of identity and their differential relations. It does, however, reposition masculinity and femininity, such that they are no longer the basis of analysis, but rather are considered as components of assemblages, active in their connections with other elements, and equally traversed by the productive relations of power immanent to any given assemblage.

Adopting a Deleuzian approach requires a substantial reassessment of understandings of technology for feminists. It refuses deterministic accounts of technologies, whereby

they are inherently aligned to the masculine and function to disseminate and perpetuate masculine power. Thought in terms of assemblages, the relations between technology, men and power are more complex, varied and also inherently contingent. For feminism, this suggests that women are never essentially excluded from, or incompatible with, technology, that any such distribution or hierarchising occurs within the operations of particular assemblages. The counterpart to this position is, of course, that women cannot simply avail themselves of power by acquiring technologies invested with it. A more nuanced analysis of the relations between particular configurations of power relations – particular diagrams – and technological objects, practices and discourses is required. Feminists need to examine specific assemblages in order to uncover how technologies and men are placed in proximity, how they are mutually configured in the process of assemblage, what forms and functions of the technological (and the masculine) are articulated within these specific assemblages and, further, what forms and functions of femininity also appear. This form of micro-analysis makes it possible to map the relations between technologies and women, but only on the understanding that such a map is particular and specific and cannot be universalised. For example, the question of women and computers needs to be broken down into as many analyses as there are practices: women in chip factories in South East Asia, women programmers in silicon valley, feminist list-serves on the internet, lesbian cafes in cyberspace and so on. This demassification of feminist accounts of technology signals a further conceptual reorientation required by the articulation of a positive difference, outside the logic of identity. Woman itself as a singular category must be relinquished.

If man, as subjective 'I', is a product of the epistemological categories and modes of knowledge, and his dissolution a goal of feminism, then, to the extent that woman as a

figure is equally articulated through those categories she too must be surrendered. In displacing the epistemological structures of identity, sexual difference can no longer be articulated in terms of the difference of woman *from* man. Rather, to think sexual difference as a difference in kind is to set it loose in a field of proliferation:

> beyond identity and subjectivity, fragmenting and freeing up lines of flight, liberating: a thousand tiny sexes that identity subsumes under one. (Grosz. 1993:178)

While dismantling the category of woman might seem to render feminism redundant, this need not necessarily be the case. Rather, it suggests that feminism must reorient and refine its aims, practices, and conceptual foundations. In a very tangible way, it allows space for recognition of the difference between women and insists on the importance of local and particular politics. Goulimari suggests that this has been an operative practice in feminism for some time and that "most feminist political projects intervene against specific contexts and, as such, are irreducible to a global feminist project"(1998:114). She argues for a 'minoritorian feminism', within which no overarching common context is imposed across diverse and numerous feminist activities. Such a feminism would require refining the questions we ask, such that there no longer is a general question of 'woman and technology'. This question becomes fractured into as many questions as there are practices, events, bodies, connections and encounters. A feminist analysis would look to each particular assemblage in order to discern the particular manifestations and articulations of power, discourses, femininity, bodies, technologies and so on. This localism does not refute the existence of widespread institutional oppression, discrimination and exploitation, since such distributions of power are equally functional within any assemblage. However, it does

change how we understand them, by rendering these formations, however seemingly universal and powerful, contingent and transitory. It becomes a matter of examining each assemblage and discerning how such formations come into play, mapping the intricacies of the connections and relations of forces to uncover how particular hierarchies and arrangements congeal and operate.

Rethinking feminist aspirations through the conceptual horizon Deleuze and Guattari elaborate appears to undermine vast tracts of feminist theorising and activism, even to the extent of displacing the very basis of feminism, woman. However, while it may indeed signal that some of feminism's previously cherished concepts and fundamental assumptions must be surrendered or radically revised and new analytical methods and concepts developed, I would argue that there is a substantial gain to be made. The most significant gain answers to one of feminism's fundamental impulses, the desire for transformation. The logic of identity is a closed system, within which radically transformed futures cannot be thought. A Deleuzian horizon of multiplicity, difference in kind, the movement of becoming, the actualisation of virtual futures, is one in which nothing is foreclosed, where the possibility of novel and unpredictable formations and relations can be thought. While this is a valuable asset in terms of feminism's transformative aspirations, it does come at a cost. To forego teleology is also to give up the notions of revolution, utopia and progress, in so far as the possibility of unpredictable change includes the possibility of other and different oppressions and exclusions as much as the possibility of new liberating forms and configurations.

Deleuze and Guattari offer an approach in which it becomes possible to think radical transformation, and within which women are not bound to a category of woman as

subordinate to man. It redraws the categories and frameworks of knowledge, such that it is possible to think otherwise, to apprehend connections and relations being assembled between bodies and technologies other than through enduring representative categories. For feminists concerned with the transformational possibilities of technologies, it frees technologies from a deterministic structure of subject/object and thus opens the possibility of creative and productive connections that might precipitate new becomings. At the same time, it allows an assessment of the intersections between technologies and men and women in terms of prevailing relations and distributions of power. Installing an alternative conceptual horizon will not, in itself, effect a wholesale transformation of the lives and activities of women and men. Clearly, there remains a pressing need for everyday intervention and political action. It will, however, open up the possibility of thinking new and radically transformed futures, which remains a crucial element of feminism as an aspirational enterprise.

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[1] These debates derive their focus from the various positions within feminist theory from which they are articulated. Corporeal feminists are interested in ideas about the body-without-organs while it is primarily the concept of 'becoming woman' which has been the focus for most feminist interest and critique. Dorothea Olkowski (1999) pp 32 - 58 gives a succinct and perceptive summary of this debate which ranges across those who see it as yet another appropriation of the feminine (Jardine 1984), to those who see it as a strategic and purely conceptual configuration (Grosz 1994), (Braidotti in her later work 1993), (Goulmari 1999). Other feminists such as Olkowski, Colebrook and Grosz in recent work, are less interested in specific concepts such as 'becoming woman', than in more general philosophical question: time and space for Grosz (2000); representation for Colebrook (2000); representation and psychoanalysis for Olkowski (1999); psychoanalysis and subjectivity for Lorraine (1999).

[2] Buchanan points out that both the tree-root and the rhizome are assemblages, but assemblages which tend to toward structure or more toward rhizomatic (2000:119). On this understanding we do not find in Deleuze and Guattari any simplistic opposition between structure and rhizome. Moreover it signals the ability of this conceptual model to account for structures as operational. It is important that we be able to account for structures, or the various tree-root systems, within the theoretical horizon which Deleuze and Guattari elaborate. Otherwise we end up with a 'model' which is somehow external to all of those formations, and thus a model of knowledge wherein concepts are something which are overlaid onto 'reality'. This is precisely the formulation which Deleuze and Guattari are trying to avoid. Thus in this discussion where I describe assemblages as not being structures but as rhizomatic, I am describing them as they embody the conceptual shift which Deleuze and Guattari make and of which the figure of the rhizome is exemplary, rather than setting up a straight-forward opposition between assemblage-structure.

[3] To a limited extent this approach informs the work of feminists such as N. Katherine Hayles (1999) and Anne Balsamo (1996). In their examinations of the question of disembodiment they consider how discourses of information as disembodied, and the subsequent elaboration of a mind/body configuration, gives rise to particular formulations of bodies in a range of scientific and medical practices.

[4] This is a significant part of their project in *A Thousand Plateaus* where they investigate the patterns and modes of stratification which characterize feudal, despotic and nomadic assemblages.

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