The Problem of Nature

in

Contemporary Social Theory

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Declaration.

I hereby certify that the work contained in this thesis is my own work, and that I have cited in the references all works and sources consulted in the writing thereof.

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Abstract

This work examines the ways in which the relationship between society and nature is problematic for social theory. The Frankfurt School's notion of the dialectic of enlightenment is considered, as are the attempts by Jurgen Habermas to defend an 'emancipatory' theory of modernity against this. The marginalising effect Habermas' defence of reason has had on the place of nature in his critical social theory is examined, as is the work of theorists such as Ulrich Beck and Klaus Eder. For these latter authors, unlike Habermas, the social relation to nature is at the centre of contemporary society, giving rise to new forms of modernisation and politics.

Michel Foucault's work on biopolitics and governmentality is examined against the background of his philosophical debate with Habermas on power and rationality. The growth of scientific ecology is shown to have both problematised the social relation to nature and provided the political technology for new forms of regulatory intervention in the management of the population and resources. These new forms of intervention constitute a form of *ecological* governmentality along the lines discussed by Foucault and others in relation to the human sciences.

However, Foucault's work is not sufficiently critical of the relationship between the natural sciences and power. Extending Foucault's biopolitics to environmental discourse is consistent with his general approach to power, but his *incomplete critique of political sovereignty* meant that for him agency remained tied to an idealised notion of the autonomy of the human subject. He therefore made too strong a distinction between the human and natural sciences and between power and the capacities of non-human entities, and continued to view the natural sciences as separating themselves from power in a way that was not possible in the human sciences.

A more general critique of *epistemic* sovereignty reveals that the natural sciences (including ecology) are subject to disciplinary and normalising practices similar to those of the human sciences. Foucault's key inadequacy is that he linked agency to human autonomy and sovereignty. The work of Bruno Latour and other actor network theorists show that an unambiguous ontological distinction between nature, material technologies and active human subjects is highly problematic. In the place of a separate 'society' and 'nature', this thesis argues that it is preferable to see these as a single *socio-nature* populated by the hybrid products of translation networks.

By drawing together the insights of recent governmentality studies and the approach of actor network theory to agency and translation, Foucault's concept of biopolitics can be adapted to provide a theoretical framework for understanding the ecological programs of government that have emerged around the *problem of nature* in second half of the twentieth century.

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Chapter 1

Introduction: the problem of nature

Most contemporary Western thinking about the natural environment is characterised by an ecological view of nature, that is, by the belief that the relationship between human society and nature must, at least to some degree, be managed or guided by the principles and laws expounded by the science of ecology. The research problem that underlies this thesis is how the natural sciences, and ecology in particular, contribute to the governing of human conduct through the representations of nature they provide. The thesis is a critical reflection on how the representation of nature by scientific expertise acts as a political resource which actively constitutes the objects of government and at the same time provides the intellectual machinery or 'political technology' necessary for such government.

More particularly, this thesis is about *the problem of nature* in contemporary social theory. It examines the way in which two major theoretical perspectives - a German tradition of critical theory drawing on the work of the Frankfurt School and Jurgen Habermas, and a post-structuralist tradition deriving from the work of French theorists Michel Foucault and Bruno Latour - engage with this problem. Why study these two schools of thought? Both perspectives have something significant to say about the relationship between society and nature, and I wanted to explore the implications of the different approaches for how we understand key concepts in political philosophy such as power and agency, and how these relate to contemporary concerns over the natural environment.

The problem of nature as approached here is not primarily the problem as framed by the rationalist and utilitarian traditions, of how to subject nature through science and technology to human ends such as economic growth. Rather the problem is one that results from the apparent success of such economic development and scientific 'domination' of nature. The problem is most clearly evident in the contemporary ecological notion that the exploitation of nature in modern industrial society puts at risk not only human welfare but also the material basis of *life* in general. The 'problem of nature' should be understood subject to the qualification that in using this term I am referring specifically to the *contemporary theoretical formulation of the natural environment as an issue of social concern and as a site of political conflict.* By pointing to the *theoretical formulation* of the social relation to nature as a problem, I wish to emphasise that this process is an important discursive development not only within political and social theory, but also within key areas of the natural sciences. Thus, environmental risk is an issue that, in one form or another, has increasingly

occupied the social and biological sciences over the past four decades, and has been the focus for an expanding domain of policy formulation and administrative intervention by States, international institutions and social movements.

This work is firmly situated within the context of those contemporary environmental debates and problems of ecological risk. Yet, I am not concerned here with the scientific details of such issues in a substantive way. Neither am I directly concerned with the evaluation of policies and regulatory instruments that might be appropriate and efficacious for the management of environmental problems. This is not to suggest that these tasks are unimportant, or that the conclusions of this thesis have no relevance to the policy and practice of environmental protection. [1]

The German critical theory tradition – stretching from Weber via the Frankfurt School to contemporary theorists of a new politics of ecological modernisation such as Klaus Eder and Ulrich Beck – is intimately bound up with the critique of the process of rationalisation. This tradition sees societal rationalisation as the dynamic behind modernisation and takes seriously the heteronomous effects of technocratic rationality on human freedom. German critical theory has been one of the most outspoken critics of the effect of such technocratic rationalisation on human autonomy. At the same time it has also sought to preserve the notion that there is an underlying normative content of reason which is essential to human freedom and social progress.

The Frankfurt School (particularly Horkheimer and Adorno) and recent theorists such as Eder and Beck have taken as central in their work a close connection between the scientific domination of 'external' nature and repression of human 'inner' nature. In doing so they have anticipated from a social theory perspective, themes taken up in environmental discourse over the past four decades, and have done so with a degree of philosophical and sociological sophistication that has generally been lacking in the moralistic and scientistic efforts of much environmental dialogue. Nevertheless, this German tradition, including contemporary theorists such as Beck, in the end fails to break with the tendency to seek a 'dialectical unification of processes of rationalisation', and to privilege the abstract and general over the substantive analysis of the multiple and dispersed forms of practical and technical rationality which characterises the work of the theoretical tradition deriving from Foucault. (Dean, 1998b)

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[1] In fact, I consider these to be important matters. Environmental policy and regulation are issues with which I have been engaged for over 17 years of professional life - within non-government environmental organisations, with State environment protection agencies, and in university teaching.

The thesis is more sympathetic to work of the French theorists Foucault and Latour. While the work of each has a different focus – Foucault is perhaps best characterised a political philosopher, while Latour is a sociologist of science – each can contribute to the development of a more satisfactory understanding of the dynamics underlying contemporary ecological discourses and practices. In particular both authors, albeit in different ways which I consider in some detail, place particular importance on the relationship between expertise, scientific knowledge, and government. *Government* is not simply (or in many instances, even primarily) the activities of the State. Rather it is seen by both theorists as a series of matrices or networks of power through which authorities of all sorts (scientific, moral, economic, legal, technical, as well as 'political') attempt to translate their plans, calculations, schemes and interests in ways which shape the conduct and beliefs of others. Rose and Miller (1992 p.175) most succinctly sum up this perspective when they say that

> Knowledge is central to these activities of government and to the very formation of its objects, for government is a domain of cognition, calculation, experimentation and evaluation. And, we argue, government is intrinsically linked to the activities of expertise, whose role is not one of weaving an all-pervasive web of 'social control', but of enacting assorted attempts at the calculated administration of diverse aspects of conduct through countless, often competing, local tactics of education, persuasion, inducement, management, incitement, motivation and encouragement.

These comments direct our attention to one of the key elements that distinguish this approach from the other main theoretical perspective considered in this thesis, the critical theory of Jurgen Habermas and the Frankfurt School. Both Foucault and Latour decline to understand the relationship between the technical and the political as an opposition (although as I argue Foucault's approach has significant shortcomings). The technical is not something that interferes with or frustrates the realisation of the potential for human freedom, but rather is fundamental to the constitution of agency. Hence, the problem of nature is examined here within a specific theoretical framework. That framework draws on both the work of Foucault (and those scholars who have developed his work on political philosophy and especially 'governmentality' over the past 15 years) [2] and

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[2] I am referring to the works of Nikolas Rose and Peter Miller in particular, but also important work by Barry Hindess, Mitchell Dean, Paul Patton, Joseph Rose, Graham Burchell, and Colin Gordon, among others. For the major contributions see Barry *et al.* (1996); Burchell *et al.* (1991); Dean (1994); Gane and Johnson (1993); Gordon (1991); Hindess (1996); Miller (1987); Moss (1998); Patton (1994); Rose (1999); Rose and Miller (1992); Rouse (1987).

the work of Bruno Latour and those associated with what is known as actor network theory.[3]

Environmental issues and conflicts have generated a substantial literature in political science (especially the policy studies area), philosophy (particularly in ethics), sociology (social movement theory), law, economics, and geography. Environmental conflicts make problematic the modes of conduct with which we relate to the natural environment. What is at issue then, are the ways in which specific social activities or technical practices affecting the natural environment are turned into problems and challenged, giving rise to conflicts over how such problems should be dealt with.[4] Taking up the sort of analysis explored by Foucault, the problem of the social relation to nature can be understood as involving four different dimensions of 'government', each of which shapes the ways in which we relate to and interact with the natural environment. These four dimensions of government are forms of knowledge, relations of power, technical rationalities, and practices of identity formation. Thus, as James Tully has expressed it

> Our 'relation to nature' in any organised form of practice, such as, say, forestry, is a complex experience that conjoins four dimensions: (1) a field of knowledge (including concepts, theories, economic, scientific, and political disciplines, practical know-how and so on, often at odds with each other), (2) ways of governing the individuals and groups involved in this activity (employing techniques, rules, procedures, relations of power, and so forth), (3) the practical rationalities in accordance with which human aptitudes are exercised on nature through various technologies, and (4) the practices of self-formation available in our cultures by which individuals make themselves over as ethical agents in relation to nature. (Tully, 1997 p.6)

Employing this general approach the thesis shows how Foucault's notion of biopower can be adapted to the understanding of environmental government. Biopower is that aspect of modern power, according to Foucault, which is simultaneously focused on disciplining of the body of the individual and managing the population through the regulation of its biological processes. Following from this, I advance three central propositions in this thesis. First, the concern with environmental problems and ecological risk which has emerged to prominence in the past four decades can be seen as a development of what

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[3] I include in this Latour's early work with Woolgar (Woolgar and Latour, 1979) and the work of Callon and Law. See Callon (1986); Callon and Latour (1981); Latour (1983); (1987); (1991); (1993); Law (1986); (1991b); (1994).

[4] Sometimes of course, the conflict is over whether or not there is a problem – this was particularly evident in the earlier stages of the debates on both ozone depletion and global warming.

Foucault called 'the regulatory biopolitics of the population'. Second, this relatively recent articulation of biopolitics gives rise to new techniques for managing the environment and the population, which are dependent on the institutionalisation of new areas of scientific expertise, which is itself based on a bio-economic understanding of global systems ecology. Third, this aspect of contemporary biopolitics is expressed as a distinctive mode of governmental rationality that I describe as *ecological governmentality*.

As I have noted, examination of the work of the German scholars mentioned above reveals a concern with the processes of social rationalisation that locates the problem of nature as a consequence of modernisation. Discussion of how the problem of nature relates to the wider concerns of a critical social theory leads into the major debate between Habermas and Foucault on power and rationality. While Foucault's view of power is superior to that of Habermas and critical theory, there is nevertheless a significant gap in his work as it applies to the natural sciences. Indeed, it is argued that while the extension of Foucault's notion of biopolitics to environmental discourse and the natural sciences generally is in many respects consistent with his theoretical approach, he appears reluctant to do this in the way he did with the human sciences.

Foucault was unwilling to consistently extend his genealogical approach to power and knowledge from the human to the natural sciences. The thesis concludes that this is because, despite his critique of the traditional view of political sovereignty (in which power is seen as a 'possession' centralised in the State and largely equivalent with domination), Foucault does not take the critique of sovereignty far enough. He retains a view of agency that is tied to human autonomy, and which in some key respects idealises political sovereignty as the absence of domination or even disciplinary power. He also appears to accept a fairly conventional view of the natural sciences, affording them a special epistemological status in which scientific knowledge is somehow able to detach itself from the relations of power that he sees as inextricably tied the knowledge and practices of the human science. In order to carry the critique of political sovereignty further a more thorough critique of epistemic sovereignty is needed in which all forms of scientific representation are subjected the same sorts of rigorous examination given by Foucault to the human sciences.

A major finding of the thesis is that the problems of sovereignty which have prevented Foucault and subsequent governmentality studies from consistently applying the insights of this approach to the natural sciences can be overcome by drawing on the work of Latour and actor network theory. Actor network theory is broadly consistent with the approach developed by Foucault and has been influential in providing some of the key concepts employed in governmentality

studies. [5] However, its most significant advantage is that it is able to deal with the problem of agency in a more satisfactory and less anthropocentric manner than does Foucault. This is achieved by rejecting any rigid ontological and epistemological distinctions between subject/object and human/non-human, and by showing that agency is not exclusively a property of the human subject. Rather agency is a characteristic of networks composed of hybrid *actants* (rather than *actors*). Actants are entities made up of a 'socio-nature' that collect together and translate a diverse assemblage of capacities, powers, resources, technologies and practices in the complex and multiple ways suggested by governmentality studies.

By recognising the centrality of material technologies (such as inscription devices) in the scientific representation and mobilisation of 'nature', the actor network approach permits genealogical analysis of the social relation to nature in a way that more fully accounts for the complex inter-relationship between the social and the technical. Power is not only the human capacity to act and shape the conduct of other humans, but is a feature of any capacity to act, no matter what the source of that action. Agency then is a property of a network, elements of which will be non-human and may have a significant enough capacity to initiate or direct action as to qualify as an 'agent'.

The approach explored in this thesis is intended to contribute to two important tasks in political philosophy and social theory. The first is to develop the substantial insights of Foucault's work on biopolitics and governmentality (and subsequent studies on governmentality by others) and apply these to the analysis of environmental politics and the role of the ecological sciences in the emergence of new forms of governmental rationality. Until the recent publication of an edited collection (Darier, 1999a) there had been no major attempt to bring Foucault's work to bear on environmental concerns. However, as I have argued in my contribution to the Darier collection and elsewhere, [6] the biopolitical management of the population is only possible if at the same time the natural environment on which the population depends is itself subject to scientific and political thematisation and problematisation. The second task is to open up a more robust and focused dialogue between the substantial and important bodies of political theory – particularly governmentality studies and actor network theory – that I have drawn upon in this thesis. As I have shown each 'school of thought' is aware of the other and each acknowledges the influence of the other on its own approach, but this is something that tends to occur in the background.[7] In the governmentality writings, this is no doubt a reflection of the biases in Foucault's

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[5] In particular the work of Nikolas Rose and Peter Miller. See Chapter 8 of this thesis.

[6] See Rutherford (1993), (1994a), (1997a), (1999b).

[7] Law (1994) and Kusch (1991) provide what are probably the most serious attempt to engage the two schools of thought.

work against the natural sciences. Similarly, as actor network theory developed out of the sociology of science and science studies, it has primarily been interested in those areas – the natural sciences and material technologies – neglected by Foucault (and those most influenced by his work).

Structure of the thesis

The remainder of the thesis, following this brief introduction, is divided into two main parts. Chapters 2, 3 and 4 deal with the problem of nature in what can be broadly described as the German critical theory tradition. Chapter 2 by way of background considers the counter current to the Enlightenment view of modernisation and progress which is evident in Weber and the Frankfurt School's appropriation of him and Nietzsche. This view, most evident in Horkheimer and Adorno's book Dialectic of Enlightenment, argues that the same processes of societal rationalisation which were responsible for progress through the domination of nature also reify and distort human inner nature. Horkheimer and Adorno therefore rejected the Enlightenment's philosophical separation of subjectivity and nature, and argued instead for emancipation of both natures from the violence of 'identity thinking' through an aesthetic reconciliation between the two natures. This is a move that draws on Nietzsche's critique of morality and science, and which is attacked by Habermas as 'reducing' truth to power and undermining the possibility of rational social critique, a charge he also makes against Foucault's work.

Chapter 3 examines Habermas' attempt to develop critical social theory in a direction that would overcome the Frankfurt School's 'one dimensional' view of rationality. The focus of the chapter is on how in his reconstruction of critical theory, Habermas deals with the problem of the relationship between 'inner' and 'outer' nature as presented in Horkheimer and Adorno's critique of instrumental reason. This involves a detailed consideration of his early work in which the natural history of the human species is seen as giving rise to a series of knowledge constitutive interests. The chapter then goes on to examine the recasting of the problem of nature in his later theory of communicative reason with its shift to linguistic philosophy and systems theory. Both theoretical approaches, but particularly the latter, are only able to overcome the problem of nature by maintaining a radical separation between subjectivity and nature, and arguing the only 'theoretically fruitful' attitude to nature is a strategic, instrumental one. Some key criticisms of Habermas' work are reviewed, focusing in particular on the anthropocentric character of his rigid separation of nature and society, and his dismissal of ecological movements as marginal and anti-modernist.

The critique of Habermas is developed further in Chapter 4 where the contemporary work of the theorists Ulrich Beck and Klaus Eder is examined in some detail. Unlike Habermas, both authors see the problem of nature as central

to contemporary social relations and the direction of further modernisation, and regard ecological problems as providing the basis for new social divisions and conflicts. Particular attention is given to the ways in which these authors argue that the problem of nature in contemporary technological society is taken up by ecological movements. Contrary to Habermas, for these theorists such movements are not anti-modernist or irrational reactions to the complexity of social rationalisation, but represent alternative, critical views of the course of modernisation. Instead of being marginal, such movements can be seen as significantly influencing the future direction of modernisation in technological society.

Chapter 5 sets the ground for the transition to the second part of the thesis, by introducing discussion of Foucault's work, and more importantly by examining the core differences between Habermas and Foucault over the nature of power and rationality. This is important as Habermas' criticisms of Horkheimer and Adorno parallel those he directs at Foucault and other 'post-structuralist' theorists. My argument in the second part of the thesis – that a more useful theoretical framework for understanding ecological issues is found in Foucault's concepts of biopolitics and governmentality – is in part developed through this critique of the shortcomings of Habermas' view of power and its relationship to the natural sciences. However, despite the differences, some common intellectual concerns between the critical theory tradition and Foucault are evident, and these are briefly considered in this chapter.

The second main part of the thesis consists of Chapters 6, 7 and 8, which deal with the problem of nature as it arises in bodies of work influenced by two French theorists of power, Foucault and Latour. Chapter 6 examines Foucault's work on biopolitics and governmentality in detail. The intersection of what Foucault calls the emergence of the 'population-riches' problem and beginnings of the environmental discourse are explored. It is argued that the extension of the notion of biopolitics to the ecological relations of populations to their environment is consistent with Foucault's approach. This is demonstrated with a discussion of the emergence of modes of governmental rationality that problematise and discipline the social relation to the natural environment. Particular emphasis is placed on the role of scientific expertise in this process, and the emergence of ecology as a regulatory science, with functions not unlike those evident in the application of biology to the human sciences.

Chapter 7 commences with a discussion of Foucault's view of the relationship between power and the natural sciences. It is shown that Foucault was far more ambiguous about this than he was with the 'dubious' human sciences. In fact, Foucault regarded the natural sciences as having attained a degree of 'formalisation' and 'objectivity' that allowed them to free themselves from power in a way he regarded as impossible for the human sciences. The chapter identifies the source of this approach in an underlying conception of subjectivity, evident in

his later works, which identifies agency and power with an idealised view of human autonomy. It is argued that his critique of political sovereignty needs to be carried further, to more thoroughly scrutinise the relationship between power, domination and agency. It is also argued that this needs to be broadened to a critique of epistemic sovereignty in general, so that the same sort of critical, genealogical questions as are put to the human sciences are also asked of the natural sciences.

Chapter 8 discusses the work of Bruno Latour and Michel Callon, and what is known as actor network theory, and considers the intellectual affinities of this with Foucault and some of the more recent work on governmentality. Following the criticisms of Foucault's approach to agency and the natural sciences in the previous chapter, it is suggested that actor network theory can provide a way of overcoming these shortcomings. Of particular importance is the use of what Callon terms the principle of generalised symmetry. This is the methodological cornerstone of actor network theory, and requires that irrespective of whether human or non-human phenomena are studied, the same analytical framework should be used. In line with actor network theory's socio-technical approach, this principle cautions against the assumption that agency is necessarily a human characteristic. In making representational distinctions between 'subject' and 'object' problematic, this approach is able to follow through on the need identified in the previous chapter to extend Foucault's critique of political sovereignty to that of a critique of epistemic sovereignty and all modes of scientific representation. In doing so it thereby focuses attention on agency as an effect of socio-technical networks rather than as an inherent property of the human subject.

Chapter 9 is the conclusion, and consists of two broad sections. The first reviews the key themes and findings of the thesis, while the second briefly considers some of the theoretical implications of these findings for political philosophy and social theory, and the ways in which these disciplines deal with the analysis of contemporary ecological problems.

Chapter 2

Background: the negative dialectic of progress

Introduction

This chapter examines some key social theorists who have been concerned in varying ways with understanding modernity and who have questioned the consequences of the rationalisation of society associated with modernisation. In particular I focus on the Frankfurt School theorists Horkheimer and Adorno and their diagnosis of the 'dialectic of Enlightenment', although in doing so I also briefly discuss the influence of Weber, Nietzsche and Lukacs.

Modern Western political thought has portrayed human history as the struggle to establish and maintain the material security of existence through the control of nature. This discourse underlies a multitude of human endeavours - from battles to subdue disease through medicine and public sanitation, to the drive for development and industrialisation, to the rise of contemporary programs to deal with the unintended contamination of the global environment by the unwanted by-products and effects associated with the success of that same techno-industrial development.

At their core, these notions presuppose biological embodiment as a fundamental feature of human being. This claim, obvious in itself, has formed the starting point for a broad range of problems in political philosophy and social theory, from Hobbes, through Marx, Nietzsche and evident in contemporary discourse about global ecological crisis. This concern with survival reflects an understanding of human beings as simultaneously possessing a dual nature – a species-being and a cultural-being. The tension between culture and nature is manifested in numerous ways. It is crucial to the development of concepts of what it is to be a person. What makes humans different from other living things, on this account, is not any special relationship with the divine or mystical, but human self-consciousness, our cultural, language dependent differentiation from the merely biological. Additionally, and this is frequently taken as the distinguishing characteristic of modern societies, some peoples have developed a capacity to, and propensity for, the systematic scientific investigation of the world and the technological manipulation of the human biophysical environment. This interplay of culture and nature thus leads to those characteristics which define the modern human subject - self-reflective agents pursuing a fundamental drive for self-preservation through the rational manipulation of the non-human nature to enhance the security and welfare of human beings. It is this relationship between

society and our environment that in recent decades has given rise to increased consideration to the problems of ecological crisis.

Weber: the 'iron cage' of societal rationalisation

The work of Max Weber was centrally concerned with the processes of modernisation, which he interpreted as involving the progressive rationalisation of society. Rationalisation for Weber signified the spread of scientific specialisation and technical differentiation peculiar to Western culture. (Smart, 1983 p.123)[8] His theory of rationalisation distinguished three aspects of rationality - purposive, formal and discursive. Purposive rationality is that involved in the selection of the most efficient means to achieve specific objectives and is directed towards an instrumental manipulation of outcomes. It is particularly related to increasing the efficiency of administrative and economic actions. Formal rationality, for Weber, referred to a broader or more generalised systematisation aimed at imposing coherence and order on the disorderly complexity of human experience, thought and social actions. Weber identified this form of rationality with developments such as the formalisation and 'universalisation' of law and the spread of bureaucratic organisation within modern society, that is, with the means and procedures for enhancing institutional calculability and control. Discursive rationality for Weber related to notions of practical reason in a more traditional Kantian sense, in that it involves adoption of coherent criteria for the substantive evaluation of the actions of individuals. Weber saw this as related to the adoption of the desacralized attitudes of modern science with its objectivity, freedom from illusion and value neutrality. (Wellmer, 1985 p.40-1)

The growth of rationalisation and the rise of capitalism Weber attributed to the development of Protestantism and its creation of a culture oriented towards the mastery, through work and science, of the social and natural environment. (Smart, 1983 p.123; Turner, 1987 p.223-4) The Weberian attitude exhibits a certain ambiguity towards rationalisation. Smart argues that the rationalisation process is not understood by Weber as representing either the 'progress of reason' or enlightenment. The focus of rationalisation is on the refinement of efficient means of social organisation. Efficiency here is in terms of the realisation of particular outcomes or objectives, so that increasing efficiency of administration and control does not signal a move toward moral progress. This instrumental rationality of efficient ends cannot provide the criteria for choosing between different values or

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[8] There are of course a variety of interpretations of Weber's work. In this Chapter I do not attempt to deal with the debates in the literature on how Weber should be read, but rather I present what could be described as 'the critical theory account'. A detailed consideration of Weber is beyond the scope of this current thesis. My concern is to present Weber (by way of background) as Horkheimer and Adorno read him for their work.

goals. Thus Weber rejected the 'naive optimism in which science ... has been celebrated as the way to happiness.' (Smart, 1983)

The increase in societal rationalisation leads, through the dominance of instrumental rationality and bureaucratic modes of administration, to an undermining of the possibilities for autonomous individuality idealised by Enlightenment thinking. Weber saw rationalisation as producing a paradox that has become a central problem in critical social theory: that the rationalisation process implies simultaneously both emancipation and reification or domination.

Wellmer (1985 p.41) argues that this paradox results from the conflation of the descriptive-analytic features of Weber's characterisation of modernity with a particular Enlightenment derived normative connotation. At the analytic level, rationalisation refers to an 'internal systemic logic' that tends towards increasing formalisation and bureaucratisation of knowledge and social action, leading to the conclusion that the modern individual must inevitably be bound by an 'iron cage' of instrumental reason and bureaucratic domination. (Smart, 1983 p.125) However, Weber's view of rationalisation is unable to escape from the normative implications of a 'more emphatic and comprehensive idea of reason' arising from the European intellectual tradition, in which 'being rational signifies a basic condition of human beings *qua* human beings.' (Wellmer, 1985 p.41-2) Weber is unable to disengage his descriptive sociology from this broader normative assumption precisely because the rationalisation process is also a process of enlightenment. The achievements of modern science and law, bound as they are to the disenchantment of the world, represent the necessary conditions for modern individual autonomy in the Western intellectual tradition. Disenchantment for Weber represents the move from traditional authority, epitomised by religious thinking, to a modern rational worldview, characterised by the differentiation of knowledge into the domains of empirical fact and non-empirical value judgements. Disenchantment then is the process of overcoming the illusion of traditional societies that there can be any transcendental source of meaning and validity in the natural or supernatural world, that is, outside of the 'sphere of symbolically mediated human praxis.' (Wellmer, 1985 p.42) Not only is disenchantment a necessary functional precondition for the development of modern societies, in terms of facilitating instrumental rationality (in legal, scientific and administrative action), it also is central to the emergence of the modern idea of rationality (ie as reason in the comprehensive sense). This broader, normative notion of rationality is, for Weber as it is for critical theorists such as Habermas, a fundamental cognitive achievement that more than anything else defines the modern consciousness, inasmuch as it signifies the emergence of 'man' as the sole source of intersubjective meaning and validity. (Wellmer, 1985 p.42-3)

Two key concepts raised by Weber's theory of societal rationalisation, and taken up later by later critical social theorists, should be noted at this point. The

first is the notion of differentiation of value spheres, which is central to Habermas' work. This notion plays a central part in Habermas' defence of the inherent emancipatory potential of reason against what he sees as the theoretical confusion of the earlier Frankfurt School theorists, especially Horkheimer and Adorno, and 'conservatives' such as Nietzsche and Foucault. Habermas' defence of reason proceeds via an elaboration of the theory of the differentiation of value spheres and the proper relationship between different modes of rationality, and aims to overcome what he sees as the unnecessarily 'pessimistic' attitude towards modernity and rationalisation adopted by Weber and the early Frankfurt School. Horkheimer and Adorno saw the differentiation accompanying rationalisation as responsible for the rupture in modern Western thought between subjectivity and nature. Their notion of the 'dialectic of enlightenment' in which the progress of enlightenment and instrumental rationality undermines reason in the comprehensive, emancipatory sense thus replays Weber's paradoxical attitude towards rationalisation.

The second important idea is that of disenchantment. Habermas' approach to critical theory is particularly reliant on the concept of enlightenment as a process of disenchantment, as the cognitive overcoming of illusion and metaphysics. This is crucial to his defence of what he characterises as the 'unfinished' project of modernity, in that he values science and formal legal-political institutions as positive achievements of modernity, achievements that are founded on the forms of rationality made possible by the cognitive functions of disenchantment. The result of this is to render all claims as to the validity of knowledge and moral-practical action susceptible to 'intersubjective redemption' through rational argumentation. Habermas, although critical of the dangers of societal rationalisation for the possibilities of emancipation, is thus concerned not to accept the 'pessimistic' conclusions of Weber, and Horkheimer and Adorno, regarding the role of reason as such. This view of the rational-critical attitude as implicit to modernity plays a central role in Habermas' formulation of the relation between nature and humanity (which I will consider further below). It is also central to his critique of the earlier Frankfurt School theorists' view of the inevitable complicity of 'reason' in the reifying separation of subjectivity and nature.

The Frankfurt School: the Dialectic of Enlightenment

Weber's sociology understood the process of rationalisation as directed towards the administration and mastery of the social and natural environment, and saw this as providing the conditions for the emergence of capitalism in Europe. Unlike Marx, Weber did not believe that the 'reification' produced by modern society would disappear if the 'irrational' market relations of capitalism were replaced by 'rational' socialism. Indeed, he saw socialism as likely to lead to an even greater growth in bureaucratisation and regulation of society. In this sense

Weber, rather than Marx, could be said to provide an important intellectual impetus to the Frankfurt School's notion of a 'totally administered society', but also, through this, to the concept of 'industrialism' which has been influential in both New Left and Green thinking. [9] By adapting from Weber the notion of a 'negative dialectic' of modernity, the Frankfurt School theorists (especially Horkheimer, Adorno and Marcuse) rejected the Marxist belief in emancipation as the immanent or logical consequence of the development of contradictions within the mode of production. Instead critical theorists pointed to the link between the ascendancy of an instrumental, scientific rationalism that increasingly expressed itself in a technological manipulation of nature, and the expansion of the social relations of the capitalist market. (Dallmayr, 1991 p.74-5) Of particular importance in this regard is the strong link developed by critical theory between the domination of nature and social domination. Two closely interrelated features emerge from the work of Horkheimer and Adorno in particular and are important for my purposes here. First, their further, explicit development of Weber's negative dialectic of progress, and second, their focus on the role of rational thought and science (aimed at the mastery of nature) in producing a radical split between subjectivity and nature in modern society.

Horkheimer and Adorno recognised in Weber's idea of formal and instrumental rationality an accurate depiction of the dominant features of modern industrialised society. While rejecting the 'objectivism' of the Marxist belief in the immanent and inevitable progress of social development towards a rational and just society, they nonetheless sought to preserve the possibility that such a 'liberated' society could come about. Thus, in the place of a historical continuity between capitalism and the classless, emancipated society, Horkheimer and Adorno posed the need for a radical break with 'the continuum of progress'. As Wellmer indicates, their critical theory makes two key claims about the process of societal rationalisation:

> First, they claim that the realisation of the demands of reason has become historically *possible*, given the technological development of modern industrial societies - if only individuals would grasp this possibility; and secondly they claim that the logic of development of modern societies - of the rationalisation process in Weber's sense - points in the opposite direction and tends to lead to the establishment of a closed system of instrumental reason, of reification and repression. (Wellmer, 1985 p.46)

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[9] Industrialism is seen by many New Left and Green critics as a particular mode of economic-technological organisation common to both capitalism and state socialism which is understood as 'resting upon the ideologies of growth and technological optimism' and which aimed at the technological domination of both nature and society. See Eckersley (1992) and Marcuse (1968).

Weber identified the source of the rationalisation process as the rise of Protestantism and the consequent (unintentional) creation of an ascetic culture conducive to the development of markets, intellectual inquiry and world mastery through science.[10] Horkheimer and Adorno located the ultimate source of rationalisation as belonging to the very nature of conceptual thinking itself. (Alford, 1985b p.16) In their work they explored the increasing separation of humanity and nature, and related this to the ascendancy of formalised and instrumentalised reason in which the natural world, through science, came to be understood in terms of the operation of quantitative, universal laws. Nature came to be understood as disenchanted pure substance, 'mere matter', capable of manipulation and control in the interests of human self-preservation. Critical theory's approach to rationalisation thus rests on a series of closely interconnected arguments about the nature of rational thought and its relationship to nature.

Horkheimer, in his earlier writings had already rejected the Marxist-Lukacsian 'objectivism' that saw progress as linked to the idea of universal history. Horkheimer nevertheless maintained a belief in progress as a real historical possibility, where the concept of progress was understood primarily as the material improvement of living standards through the development of the productive capacity of society. Progress therefore was something to be pursued as a practical task, and he rejected what he saw as Marxism's attempt to invoke an 'objective calculus of suffering and improvement' which sought, through the notion of 'absolute progress', to justify past and present suffering as a historically necessary or 'unavoidable cost' of progress. (Grumley, 1989 p.160) Adorno, under the influence of Walter Benjamin and Nietzsche, was even more suspicious of the idea of progress. History was not the bearer of an immanent reality, indeed the notion of progress served an ideological function of covering up and reconciling the 'disasters' of capitalist development. See (Grumley, 1989 p.169; Held, 1980 p.208-9)

Progress for Horkheimer and Adorno then, much as for Weber, could be understood as the unceasing refinement and rational extension of the technical and economic capacities of modern society, but it did not represent in any necessary way either progress towards a morally superior state of existence nor the progress of humanity towards 'Reason'. (Wellmer, 1991 p.60) This critique of progress was further developed, as a collaborative effort in their work Dialectic of Enlightenment, (Adorno and Horkheimer, 1986) into a more radical critique of instrumental reason. While this work was originally written during the latter part of World War Two and first published in 1947 in German, it appears not to have

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[10] Turner argues that Weber saw more ancient cultural roots for Western rationality pre-dating the rise of industrial capitalism, and claims that in fact 'Weber appears to be committed to the idea that rationalisation is a long term teleological and irreversible process in Western culture.' (Turner, 1987 p.234)

had a significant impact until much later. Jay, in his history of the Frankfurt School, notes that only through wide circulation as a 'pirated' edition in Germany during the 1960s (where it 'became an underground classic') and its subsequent 'official' republication in 1970 did the book become influential. (Jay, 1973 p.255) [11]

The Dialectic of Enlightenment, and Horkheimer's (1985) The Eclipse of Reason, reflected the further distancing of critical theory from the tradition of orthodox Marxism, while at the same time confirming the continuing influence of Weber and Nietzsche. (Held, 1980; Jay, 1973) Central to the move away from the Marxist heritage was the abandonment of class struggle as the effective principle of history, and its substitution by a broader, more all-encompassing conflict between humanity and nature. The notion of Enlightenment in these works was no longer understood simply as a cultural expression of the rise of capitalism, but as the *fundamental* feature of Western thought and society in general. Tied to this was the implicit critique of Marx as standing firmly within the Enlightenment tradition, and the more explicit rejection of Marxism's central emphasis on labour as the mode of self-realisation of the human species. This emphasis on humanity as an economic animal, according to Horkheimer and Adorno, resulted in Marxism's 'reification of nature as a field for human exploitation' which continued a process that predated capitalism and appeared likely to persist, even intensify, beyond capitalism. (Jay, 1973 p.256-8) In this respect, critical theory echoes Weber's tendency to see rationalisation as a long-term process inherent in Western culture, transcending the specific historical development of capitalism. (Turner, 1987 p.234) Thus the radical critique in Dialectic of Enlightenment is directed at the Enlightenment tradition and Western thought itself, that is, at the process of disenchantment described by Weber.

Weber has often been read as expressing resignation towards the rationalising processes of modernity. (Jay, 1973 p.259; Smart, 1983 p.125) Smart argues that while Weber identifies domination with the spread of rational discipline necessary for modern bureaucratic modes of authority, his notion of charismatic authority, through its capacity to disrupt the routinisation of everyday life, also retains a metaphysical function. This 'constitutes the sole locus of a possible, if temporary, freedom for the individual from processes of social determination in general, and rationalisation in particular', even though this too is likely to succumb to routinisation. (Smart, 1983 p.130) The work of the Frankfurt School displays a similar ambivalence. As with Weber, it is unwilling, indeed persistently unable, to break from an emphatic, positive notion of Reason. At the same time, a pessimism

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[11] The influence of Frankfurt School (especially Eric Fromm and Herbert Marcuse) on New Left was significant, and via this there was an indirect influence on the left of the Green movement, particularly in Germany but also in the USA. See Betz (1991) and Jamison and Eyerman (1994).

and lack of clarity about the means of achieving a break with the dominance of instrumental rationality and 'identity thinking' prevail. It is this tension that critics, such as Habermas, see as forming the basis of a fundamental aporia in the notion of dialectic of enlightenment. However, before considering these criticisms, it is necessary to consider in more detail the Frankfurt School's critique of instrumental reason and the relationship of this to the perceived split between the modern subject and nature.

The critique of instrumental reason

Horkheimer and Adorno saw the radical separation between subjectivity and nature as the hallmark of modern society. This separation Horkheimer identified with the rise of scientific thinking, and related to the growth of pervasive forms of political domination. The Renaissance, through science, introduced a new view of the natural world as an object to be manipulated and mastered for human purposes. This new, objectifying attitude to nature was paralleled by the notion, most clearly manifested by Machiavelli, that human beings too were objects of domination and control.[12] According to Horkheimer, Hobbes and later Enlightenment theorists further carried this objectification of nature into the objectification of subjectivity in political theory. (Jay, 1973 p.257)[13] Thus, Horkheimer made two claims, first that the separation of 'man' from nature is undialectical, a artificial dichotomy, and second that having 'split' subject from object, Enlightenment mechanistic thinking then further reduced the subject to an object of instrumental calculation.

Against this separation, Horkheimer argued following Lukacs, that nature is in fact a social category, that is, something conditioned by social practices. Hence not only is nature dependent on human activity in that it is transformed by social practices, but also in the way human concepts of what nature is are themselves subject to change, and are therefore dependent on particular symbolic mediations and cultural significances. (Grumley, 1989 p.156; Jay, 1973 p.257) However, Horkheimer's use of the concept of nature retained a recognition (as did Marx's 1848 Economic and Philosophical Manuscripts (Marx, 1974 p.93-216)) of the biological limits on human activity. Thus nature is not only socially constituted but also provides the 'permanent arena and irreducible pre-condition of human activity.' In other words, nature as a prediscursive thing-in-itself presents itself 'both as *potentiality* and *limit* on the social meanings historically ascribed to it.'

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[12] Foucault suggests that this move to a concern with the disposition of *things* was not so much attributable to Machiavelli as to his 'police science' critics. See (Foucault, 1991c). This is discussed further in Chapter 5 of the current thesis.

[13] As discussed in Chapter 8, Bruno Latour credits Hobbes, along with Boyle, as being instrumental in the formulation and articulation of 'the modern constitution' which divides nature from society.

(Grumley, 1989 p.156) In holding to this notion of a prediscursive nature Horkheimer illustrated the complexity of this approach, for he insisted on the dialectical interconnectedness of humans and nature while at the same time rejecting an identity between these (ie between object and subject, nondiscursive thing and discursive concept). This, of course, presents difficulties for any explanation of how the alienation of humans from nature is to be overcome, for central to the critical theory of Horkheimer and Adorno (and Marcuse) is the idea of reconciliation with nature.

Adorno also attempted to utilise a notion of historicised nature, particularly in building on the Lukacsian idea of a socially constructed 'second nature'.[14] Adorno regarded both the concepts of nature and history as cognitive tools to be used in the critique of the present, that is, he insisted on emphasising the dialectical interrelationship and mutual determining of each as a means of destabilising any attempt to assign either concept an ontological primacy. The task for Adorno was thus as much to attack the myth of a 'constant nature', as it is to overcome the myth of 'progress'. (Buck-Morss, 1977 p.49) Not only are nature and history mutually determining, but each element of this dialectical doublet also express a dual character. On the one hand nature refers to embodied history, 'the material products of men's labour as well as their own corporeal bodies', while on the other hand nature is 'pre-given being' standing outside of history, reason and human mastery. (Buck-Morss, 1977 p.54) This division is reflected in Adorno's use of the idea of 'first' and 'second nature'. First nature corresponds with the sensuous, biological world, including the human body and those 'human instincts and passions repressed and displaced by civilisation'. (Benhabib, 1986 p.166) Second nature refers to the reification of the historically produced social world in which socially constituted conventions and practices are perceived as 'natural', ahistorical givens. The consequence of this is that the status quo is fetishised. Just as first nature is mythified in traditional societies, in modernity second nature becomes myth. (Buck-Morss, 1977 p.55-6; Held, 1980 p.167-9) Adorno's method of critique was therefore to use 'nature' and 'history' as

> cognitive concepts which demythify reality by means of reciprocal critique. In other words, the concept of 'nature' exposes the non-identity between the concept of historical progress and actual historical reality by drawing attention to the material nature violated in the name of historical 'progress'. Similarly, the concept of 'history' unmasks the ideology which views existing social arrangements as 'natural', essential or true by invoking their historical production. (Grumley, 1989 p.166)

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[14] Susan Buck-Morss points out that the concept of 'second nature' comes from Hegel, although she also notes that Horkheimer claims the term dates from Democritus. See Buck-Morss (1977) p.55 & footnote 94 p.228)

The denial of the interdependence of the subject and nature is traced in Dialectic of Enlightenment to the spread of instrumental reason. The notion of instrumental reason as used by Horkheimer and Adorno, drew on their earlier critique of progress and a reinterpretation of Weber's concept of rationalisation in which the processes of societal and cultural rationalisation (which Weber sought to differentiate) are merged into one.[15] (Benhabib, 1986 p.162-3; Grumley, 1989 p.170) In Horkheimer and Adorno's formulation, social rationalisation involved the extension of the apparatus of administrative and political domination into all areas of social life through the bureaucratisation of institutions such as the economy, the military, education and the 'culture industry'. Such rationalisation is effected through the application of the procedures and techniques developed by science and technology that derive their efficiency from the capacity to fragment and formalise their objects in ways that enhance the controllability for specific purposes. Thus the very processes of rationalisation (societal and cultural) that Enlightenment saw as emancipatory, for Horkheimer and Adorno expressed a relentless logic of domination, not only in shaping institutional practices, but also in distorting the idea of Reason itself. The notion of a comprehensive, substantive Reason is usurped by a narrow, bureaucratic-technical instrumental rationality. Thus, the dialectic of Enlightenment is between these two forms of reason, substantive or universal Reason, and reason as the rational manipulation of the particular.

At the same time, the dialectic also concerns the way in which Enlightenment itself reverts to myth. (Held, 1980 p.150-1) Horkheimer and Adorno saw myth and Enlightenment as grounded in the same basic human need: *self-preservation*, and it is this that connects nature and history. Science is a tool employed by the human species for its self-preservation, for through the application of scientific reason humans seek to control nature. This is also the function of myth. While science objectifies nature and distances itself from its object, myth functions by the 'projection of the subjective onto nature'; both nevertheless seek to control and understand nature. (Held, 1980 p.155)[16] Therefore, while myth and enlightenment are different, there is also a functional continuity between them.

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[15] For Weber, societal rationalisation referred both to institutional differentiation between the economic and political spheres, and to the increasing formalisation of rationality within economic, political and legal institutions. Cultural rationalisation referred to the 'systematisation of worldviews' and the consequent decline in the power of myth. See Benhabib, (1986) p.379-80, footnote 19.

[16] This is one of the problems with certain green perspectives, which seek the 're-subjectify' nature, for example Mathews (1991) and Naess (1986). For critical discussion of this see Bennett (1987); Luke (1988); Rutherford (1997c).

Thus Horkheimer and Adorno claimed that the unknown in nature (including environmental uncertainty)[17], is feared as a threat to self-preservation:

> Man imagines himself free from fear when there is no longer anything unknown. This determines the course of demthyologising ... Enlightenment is mythic fear turned radical ... Nothing at all may remain outside, because the mere idea of outsideness is the very source of fear. (Adorno and Horkheimer, 1986)

At its very heart enlightenment, through science, thus aims at emancipation of the human subject from the risks and uncertainty of its natural environment, but it is a freedom sought through the domination of nature. It must be remembered however that nature is not totally separate from humanity; history and nature exist in a dialectical relation to each other. The control and mastery of 'first nature' by the subject simultaneously constitutes 'second nature'. The mastery of nature therefore also involves processes that suppress and distort the spontaneous, prediscursive instinctive drives of human beings. Horkheimer and Adorno see this drive for self-preservation and the objectification of external nature as at the same time a process of suppression of the self's own inner nature. Indeed, the modern unitary subject, the Cartesian *cogito*, is the product of this bifurcation of self and nature. It is the price paid for the triumph of reason, but reason as 'mythic fear turned radical', which becomes a systematising, totalising 'instrumental rationality' that dominates not only external (first) nature, but also social relations (second nature) and the inner, instinctive nature of the self. (Held, 1980 p.152-6; Wellmer, 1991 p.59-61)

Following Nietzsche[18], and conflating Weber's differentiation of institutional and cultural rationalisation, Frankfurt School critical theory understands the totalising, systematising force of reason as inherent in the character of conceptual thinking and language. Thus, in Wellmer's words, in Dialectic of Enlightenment

> At the heart of discursive thought we thus discovered an element of violence, a subjugation of reality, a defence mechanism, a procedure for excluding and controlling, a prearrangement of phenomena for the purpose of controlling and manipulating them, and an implicit system of delusion. This objectifying, systematising and instrumentalising reason

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[17] This is the problem of risk – see Chapter 4 for a discussion of the way this dealt with as a central theme in the work of Beck. See Beck (1992b).

[18] Here I am referring to Nietzsche's perspectivism, which at the considerable risk of oversimplification, can said to 'assert four distinguishable claims: (1) no accurate representation of the world as it is in itself is possible; (2) there is nothing to which our theories stand in the required correspondence relation to enable us to say that they are true or false; (3) no method of understanding our world – sciences, logic, or moral theory – enjoys a privileged status; (4) human needs always help to 'constitute' the world for us.' (Magnus and Higgins, 1996 p.4)

> has found its classical expression in the natural sciences; but as Foucault has shown, the human sciences can also be viewed in the same categories.[19] (Wellmer, 1991 p.60)

Horkheimer and Adorno explicitly acknowledged the influence of Nietzsche in their formulation of the dialectic of enlightenment. Their discussion of the way in which rational thought serves a basic need to control nature reflects Nietzsche's view that the striving to master nature is a universal feature of reason, that is, knowledge is fundamentally a tool of power. Nietzsche makes a clear connection between self-preservation and knowledge as the object and purpose of the 'will to power'. The drive for self-preservation is thus the 'motive' behind the development of knowledge. According to Nietzsche, 'the desire for knowledge depends upon the measure to which the will to power grows in a species: a species grasps a certain amount of reality in order to become master of it, in order to press it into service' in the interest of self-preservation. (Held, 1980 p.156-7) Our desire to know the world, not just as formalised scientific knowledge, but also in everyday judgements about how the world is or what is 'true', involves a process of abstraction and simplification that according to Nietzsche, is 'directed not at knowledge but at taking possession of things'. (Gemes, 1992 p.54) Nietzsche thus not only rejected the notion of unconditional truth, he also links particular ideas of what is 'true' to the pragmatic or instrumental exercise of power in the interests of self-preservation. Horkheimer and Adorno's characterisation of conceptual or 'identity' thought as that which imposes homogeneity and suppresses otherness is therefore clearly dependent on Nietzsche.[20]

Unlike Nietzsche's uncompromising critique of reason, or indeed Weber's ultimately fatalistic view of rationalisation, Horkheimer and Adorno attempt to retain the possibilities of both a reconciliation with nature and a comprehensive notion of emancipatory Reason. The critique of reason in Dialectic of Enlightenment is still, as Buck-Morss notes, a critique '*for the sake of* the Enlightenment and the rationality which it promised.' Horkheimer and Adorno's work should thus be read as a '*critical negation*' of the rationalist view of historical progress which preserves as its aim the realisation of human emancipation. (Buck-Morss, 1977 p.61) At its core, Horkheimer and Adorno's critique is a critique of instrumental reason precisely for the sake of re-establishing this form of 'subjective reason' as a subordinate component of a comprehensive, 'objective reason'. The pessimism of Dialectic of Enlightenment to a large degree reflected Horkheimer and Adorno's assessment of the realities of the modern totally administered society and the recent experiences of fascism and Stalinism. It also served, however, as a 'negative construct' intended to unmask

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[19] See Bennett (1987) for a discussion of this issue in terms of Foucault's work.

[20] Heidegger is also an important figure in this mode of critique. See Benhabib (1984) p.106-11.

the totalitarian currents of instrumental reason and Enlightenment thinking that threatened to destroy Reason and enlightenment in the broader, emancipatory sense. (See Grumley, 1989 p.175-7; Held, 1980 p.156-7; Leiss, 1975 p.175-7; Wellmer, 1991 p.60-63)

Central to this critique of instrumental reason was the notion of reconciliation between the subject and nature, between inner and outer nature. Reconciliation is seen as essential for emancipation because the history of the mastery of nature is at the same time the history of the domination of humanity. Such domination will continue unless humanity develops a critical understanding of the paradoxical character of human reason, that is, of the 'naturalness' of the drive for self-preservation and domination which at the same time is a trend that alienates humanity from nature. The Dialectic of Enlightenment links the growth of scientific knowledge and social progress with a retreat from the 'unreflective naturalism' characteristic of modern disenchantment.[21] However, Horkheimer and Adorno do not believe that the process can be reversed through any sort of simplistic 'return to nature' or through the invention of new nature mythologies which equate Reason with nature. To do so would be to ignore the historical realities of Enlightenment and technological progress that have brought the modern subject into existence.[22] (Dallmayr, 1991 p.76-7; Jay, 1973 p.270-2) Moreover, the total identification of nature and subject, understood as complete reconciliation would be a regression to yet another form of 'identity thinking' that reduced subject to object, rather than a dialectical mediation of the interrelated though non-identical. Reconciliation must be based not on assimilation of the differences between humanity and the rest of nature, but through the 'reflective opposition between them.'[23](Jay, 1973 p.267)

Consistent with the view of nature as a social category, reconciliation, particularly as developed by Adorno's appropriation of Benjamin's idea of 'mimesis', is not intended to imply the possibility of unmediated access to nature.

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[21] 'Unreflective naturalism' is also characteristic of much of contemporary environmental thinking. See Bennett (1987).

[22] Wellmer makes the point that Horkheimer and Adorno saw the decline of individuality in late industrial society as a 'regressive development' despite the fact that they also saw the modern *cogito* or unified self 'not in terms of the autonomous subject which was destroyed by Freud, but - rather more in the manner of Foucault - as the correlate or product of the 'discourse of modernity', namely as a disciplined and disciplining form of organisation of humans as social beings. It is violence that stands at the origin of this unified self, and not an act of autonomous self-positing.' Wellmer explains this apparent contradiction by suggesting that Horkheimer and Adorno saw the modern 'constellation of norms of rationality' as a kind of 'nodal point - like bourgeois society for Marx - through which it is necessary to pass, but which is destined to be sublated in a self-transcendence of reason.' (Wellmer, 1991 p.62-3)

[23] See Luke, (1988) and Rutherford (1993) for critiques of the deep ecology attempt at such an assimilation of the differences between humanity and nature.

Rather it recognises that history and culture necessarily mediate the relationship of humans to nature, and that any so-called 'direct' access to nature would in fact be a fetishisation of nature. (Alford, 1985b p.158) Nevertheless, the notion of mimetic reconciliation reflects the problem of characterising conceptual thinking as directed at control and self-preservation. If the systematising, disciplining character of language and rational thought always reifies and does violence to nature and the subject, then it becomes improbable that any form of *discursive* reason would be capable of breaking this circle. Indeed, Horkheimer and Adorno, faced with the conclusion that all forms of linguistic and mathematical-scientific expression are dominated by instrumental rationality, sought refuge for emancipatory thought in a prediscursive, aesthetic ideal. In particular, the problem is that formal rationality ('identity thought') becomes 'philosophical imperialism' in which truth is defined by the triumph of the universal and abstract over the particular and the real, resulting in Enlightenment transforming itself into myth. The only way to resist this is through the 'radical self-reflection of thought' to make thought aware of its 'complicity with power' and to stimulate the 'recollection of nature in the rational subject'. (Dallmayr, 1991 p.81)

Benhabib describes Adorno's notion of mimetic reconciliation as the ability of the subject to 'forget oneself' in the face of otherness, through 'aesthetic experience' of the 'naturally beautiful'. This idea of the 'naturally beautiful', as an allegory for reconciliation in Adorno's work does not represent an essentialist category but the antithesis of modern society inasmuch as that society appears in a fixed instrumental relation to nature. Mimesis is therefore the suggestion of the possibility of a non-static mediation between nature and humans, rather than the final realisation of some mystical condition beyond history. Benhabib sums this up succinctly:

> The utopia of a non-sacrificial non-identity of the subject is intimated in that non-compulsory relation to otherness which forces the subject to forget him- or her-self and to catch a glimpse of the moment of reconciliation. What distinguishes this appeal to the aesthetic, it must be emphasised, from a romantic theory of flight into nature is precisely the ambivalence of the concept of nature. Nature, for Adorno, signifies not a given entity, state, or medium, but 'otherness', the 'otherness' of society, civilisation, and reason. The semantic content of this otherness changes historically, and must be recreated again and again. (Benhabib, 1986 p.211-2)

Despite this, the characterisation by the Frankfurt School of all discursive thought as linked to instrumental reason is seen by many critics, most notably Habermas, as leading to serious theoretical problems for critical theory. In particular these critics argue that such a move undermines the notion an emancipatory moment to reason and deprives the project of rational critique of a

valid foundation. (See Habermas, 1982a p.13-30; Ingram, 1987 p.67-74 and p.213-23; Wellmer, 1985 p.46-51)

Habermas' critique of the Dialectic of Enlightenment

Habermas' intellectual project can be understood as a response to the pessimism of Dialectic of Enlightenment and as an attempt to redeem the positive emancipatory potential of the Enlightenment tradition that, on his account, remains as an unrealised practical task of the 'project of modernity'. (Bernstein, 1985 p.31) Habermas' philosophical criticism of Horkheimer and Adorno takes on greater significance because the theoretical impasses he claims to find in Dialectic of Enlightenment he also sees as repeated in the post-structuralist revival of Nietzsche, especially in the works of Foucault, Deleuze, Derrida and Lyotard. (Habermas, 1982a p.13) He sees what he regards as a clear continuity of error in the works of Nietzsche, Adorno and Horkheimer and what he describes as the 'anti-modernism' of the post-structuralist conservatism. (Habermas, 1981b p.13; Ingram, 1987 p.75) This perspective is also reflected in his analysis of the nature of new social movements. (Habermas, 1981c)

Adorno and Horkheimer had argued, said Habermas, that the separation of the cultural spheres (science, morality and art), and the loss of reason in religion and metaphysics had lead to the regression of reason in general into a 'purposive rationality at the service of a self-preservation gone wild. In cultural modernity substantive reason is stripped of its validity claims and is assimilated to sheer power.' (Habermas, 1982a p.18) Habermas however rejects this as a one dimensional, 'flattened out' view of modernity and reason, arguing instead that there remains within each of the value spheres elements of rationality which are not subsumed totally within purposive rationality. He cites such elements as those within the sciences that transcend the production of instrumental knowledge; the universalistic bases of law and morality embodied in the modern democratic and constitutional state; and the emancipatory power of aesthetic experience. (Habermas, 1982a p.18) Habermas differentiates rationality and action into various spheres or types, placing particular importance on the distinction between the communicative and instrumental forms. As a result of this differentiation of reason, he claims that the universalistic claims of 'bourgeois ideals' in the realms of morality and law represent, despite the distortions of modern capitalist society, 'an irreversible collective learning process'. This is categorically distinguishable from both the technical-developmental logic of the sciences and technology, and from the formal and bureaucratic rationalisation of social institutions. (Habermas, 1982a p.18) Thus contrary to Adorno and Horkheimer, Habermas maintains a strong belief in the potential for a democratic and emancipatory rational organisation of society, a potential that is contained in his category of *communicative rationality*, which for him is a fundamental feature of the modern 'species-being' of humanity.

Adorno and Horkheimer claimed that myth and enlightenment inevitably reverted into each other, that 'power and knowledge are synonymous' (Adorno and Horkheimer, 1986; Ingram, 1987 p.65) Habermas however argues that 'demythologisation' is necessary to distinguish between culture and nature, between the objects of human manipulation and acting and speaking agents. Enlightenment results in the 'desocialisation of nature and ... the denaturalisation of the social' leading to a decentred worldview. (Habermas, 1982a p.19) According to Habermas this decentred understanding makes possible the critique of ideology, a form of critique which seeks to 'demonstrate that the validity of a theory ... has not freed itself sufficiently from the context of its genesis ... (and that) hidden behind ... this theory is an inadmissible fusion of power and validity.' (Habermas, 1982a p.20) Hence, ideology critique carries forward the process of enlightenment by revealing categorical errors that arise from the conflation of professed validity claims (that is, veracity or truthfulness) with concealed power claims. Ideology critique becomes reflexive by carrying out its project on its own theories. Adorno and Horkheimer however, claims Habermas, carry critique to a second level of reflexivity in which the very method of ideology critique itself is brought into question through the totalised critique of all thought as expressive of power claims. With this Adorno and Horkheimer had abandoned hope in the Marxist critique of ideology and the possibility of critical social science. Their critique becomes a totalised attack on Reason as the very basis of critical analysis. For Habermas, in the Dialectic of Enlightenment,

> purposive-rationality, which had become total, eliminates the difference between that which claims validity and that which only serves the interests of self-preservation. By doing so instrumental reason breaks down the barrier between truth and power and thereby annihilates the fundamental differentiation which the modern decentred understanding of the world thought it had gained definitively by overcoming myth. Reason, once instrumentalised, has become assimilated to power and has thereby given up its critical power. (Habermas, 1982a)

These criticisms of Adorno and Horkheimer are precisely those that Habermas directs against Foucault's theory of power/knowledge. It should be noted here that in concentrating attention on those elements in Dialectic of Enlightenment that draw on Nietzsche, Habermas brings clearly into focus the key theoretical differences between himself and Foucault. I shall discuss the philosophical debate between Habermas and Foucault on power in more detail in Chapter 5.

Habermas identifies two fundamental areas in which Adorno and Horkheimer agree with Nietzsche. First, each regarded *thought* as the mechanism through which external nature is objectified and constituted as a resource for manipulation. Thought is also for both associated with the repressive internalisation of instincts and 'natural drives', that is, with the creation of 'inner

nature' or subjectivity. These modes of domination of internal and external nature result in the 'institutional domination of men over men'. (Habermas, 1982a p.24) Second, Adorno and Horkheimer's critique of instrumental reason parallels Nietzsche's critique of morality and scientific knowledge, in that for each behind the ideals of universal morality, objectivity and truth, there lies the concealed drive for self-preservation and domination, that is, the will to power. A consequence of this, argues Habermas, is that for Nietzsche the will to power destroys the possibility of any 'claim to intersubjective validity', as all judgement is in the last resort based on aesthetic preference or 'the judgement of taste'. For Habermas this also destroys the possibility of critique, for without the foundations of objectivity and universality attributed by modernist philosophy to truth and validity claims, critique loses its meaning and reduces to no more than 'difference'. (Habermas, 1982a p.25-6)

In order for Nietzsche to show why it is wrong to accept the domination of life by science and morality, says Habermas, he must have resort to some criterion on which to base such a value judgement. Habermas argues that Nietzsche's theory of power seeks to dissolve this problem by denying that value judgements are validity claims but 'mere expressions of claims to power'. (Habermas, 1982a p.27) Horkheimer and Adorno find themselves confronted with this same problem in that if they wish to retain their commitment to the practice of critique as an 'ultimate unmasking', they must also retain 'at least *one* standard for their explanation of the corruption of *all* reasonable standards.' (Habermas, 1982a p.28) It is Adorno and Horkheimer's inability to do this that deprives their critique of direction, according to Habermas. In fact, says Habermas, they simply abandon the desire to overcome this aporia, not only leaving the contradiction unresolved, but intensifying it. As a consequence Adorno and Horkheimer were unable theoretically to avoid the negativity and pessimism of Dialectic of Enlightenment. Habermas' method of avoiding this 'abyss' is to execute an abstract categorical differentiation within reason and thought, and by asserting the negative powers of reason are the result of an inappropriate dominance of instrumental or technical rationality over communicative rationality.

Nietzsche's theory of power, argues Habermas, is thus confronted with the problem that 'critique surrenders the world ... to the irreconcilable struggle between powers.' (Habermas, 1982a p.28) This, says Habermas, is also the path adopted by the post-structuralists such a Deleuze and Foucault. Although Foucault's concept of power allows for differentiation between specific discursive formations, it still however denies any basis for universal or transcontextual judgement of validity claims. It also fails, according to Habermas, to offer a solution to the aporia of a critique that denies the validity of its own premises. (Habermas, 1982a p.29)

Conclusion

The themes outlined in this chapter provide the background against which the arguments of subsequent chapters will be developed. The notion of a negative dialectic of progress is a concern that, in one form or another, influences the work of the major theorists examined in this thesis. The main elements of this negative dialectic include, first, the assertion that the key to the development of modern society, and consequently to development of the modern subject, is to be found in the processes of societal rationalisation. Second, these processes of rationalisation, while they have made possible substantial social and economic progress (through legal-political institutions and the power of science), have also come to be seen as having a darker side in which reason and knowledge have increasingly become forces of domination, discipline and control.

The way in which these themes are dealt with by social theory defines in a significant sense what Habermas has called the 'philosophical discourse on modernity'. The themes covered in this chapter are essential to understanding much of the social theoretical debate, over the last 30 years, and in particular the philosophical discourse on power and subjectivity. Such a background is therefore an indispensable starting point for a consideration of these issues in general and in particular the disputes between critical theorists such as Habermas and theorists such as Foucault.

Against this background, the chapters that follow consider the relevance of these general social theoretical debates to the analysis of contemporary discourse about ecological or environmental crisis. In this context, the current chapter has pointed to what I described in Chapter 1 as *the problem of nature in social theory*. It is against the background of the theoretical debates outlined in this chapter that I now turn in the next two chapters to a detailed consideration of Habermas' critical social theory, and the recent work of Ulrich Beck and Klaus Eder. Following this I examine the work of Foucault and consider how it may be used to understand ecological problems.

Chapter 3

The problem of nature in Habermas

Introduction

In the work of Horkheimer and Adorno the relationship between humanity and nature is considered central to social theory, and it is this particular focus that marks the later work of the Frankfurt School. The problem of the dialectical relationship between 'inner' and 'outer' nature, is as we have seen in the previous chapter, cast in a way that problematises the belief that technological and scientific progress is necessary to the realisation of the goals of human emancipation and moral progress. In calling into question this assumption, Horkheimer and Adorno's work anticipates themes common to the widespread concern with environmental problems and ecological crisis that emerged in the post-World War Two period in the industrialised Western societies.[24] The Frankfurt School and the broader discourse on the environment[25] therefore have in common a focus on what I described in the introduction to this thesis as the problem of nature.

This and the next chapter consider the problem of nature as dealt with by some contemporary critical theorists. I have not attempted a comprehensive survey of the vast literature on social theory. Rather I present an examination of selected theoretical approaches that can be considered as either central to the

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[24] This is not to claim that Horkheimer and Adorno's work directly inspired concern for such ecological problems or the development of Green political theory. Eckersley comments that while Frankfurt School Critical Theory takes up themes of fundamental significance to Green theory, such as the critique of industrialism, technology and bureaucratic state administration, it nonetheless failed to have as strong an impact on Green thought as such common concerns may lead us to expect. Eckersley (1992) attributes this lack of greater influence by the Frankfurt School largely to the direction imposed by Habermas' work on the development of Critical Theory since the 1960s (see p.97-99). It should however be noted that other Frankfurt School theorists, especially Marcuse, were influential on the New Left in the 1960-70s. There is little doubt that through this connection their ideas did have an impact on Green political theory, particularly its anti-bureaucratic tendencies. Eckersley, (1992) p.10-11, mentions this. Betz (1991) gives a detailed account of the influence of the New Left on the development of the Green movement in Germany. See especially Chapters 1-3 of that work.

[25] Here I am referring to the widespread growth of concern for the environment beginning in the 1960s and reflected in such works as Carson (1962); Commoner (1971); Ehlrich (1968); Hardin (1968); Meadows *et al.* (1972)

framing of the debate (Habermas) or as significant recent attempts to develop a more satisfactory social theoretical framework for analysis of ecological problems (Eder, Beck).[26] This present chapter further considers the way in which Habermas deals with the problem of nature as it arises from Horkheimer and Adorno's treatment of the 'dialectic of enlightenment'. In doing so I consider some of the key elements of Habermas' development of critical theory and some criticisms of this. In particular I examine his notions of 'system' and 'life-world', and his insistence that an objectifying and instrumental attitude to nature is an unavoidable cost that must be borne if we are to preserve and extend what he regards as the 'cognitive gains' of the 'unfinished project of modernity'. (Habermas, 1982b p.238-250) The following chapter goes on to consider some recent theoretical works that give ecological problems a greater sociological significance in advanced industrial society than does Habermas' consideration of these as conflicts.

The problem of nature in Habermas

As outlined in Chapter 2, Horkheimer and Adorno's analysis in the end is largely pessimistic about overcoming the historical impasse produced by modernisation. In part this reflects a continued acceptance that a relatively high level of material production, and therefore technological and economic progress, as a necessary precondition for a free and humane society. However, in Horkheimer and Adorno's view, social domination is an inevitable consequence of the domination of nature by science and technology. The only possible solution to this lay in reconciliation with nature. The difficulty of this approach [27] is that the domination of external nature required the control of inner nature, which is achieved in the human subject only through imitating the rigidity and despiritualisation of disenchanted nature within the self. According to this view, the domination of external nature is therefore achieved only by distorting and undermining the instinctual psychological structures that would provide the subjective conditions for the realisation of an emancipated society. (Alford, 1985b p.11; Whitebook, 1979 p.41) Thus after Dialectic of Enlightenment critical theory faced the dilemma of explaining how reconciliation with nature could occur while at the same time avoiding a significant undermining the productive capacity of modern industrialised society.[28] This latter question is a key focus in the

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[26] I have, for example, made only passing references to the work of Marcuse.

[27] Apart from how such reconciliation was itself *socially* possible (as distinct from a *private* intuitive or expressive reconciliation).

[28] Marcuse, despite being critical of advanced science and technology, regarded them as essential to the liberation of the instinctual nature of human beings. Advanced technology, and particularly automation, offered the possibility of the freeing humanity from engaging in necessary labour - and thus being able to enter into an instinctive, expressive reconciliation

environmental debate between 'romantic' or deep ecologists and the utilitarianism implied by the notions of ecological modernisation and 'sustainable development'.[29]

Habermas declines to accept the notion of reconciliation with nature, regarding it as regression into metaphysics. (Habermas, 1982a) Instead he challenges the central argument of Dialectic of Enlightenment as expressing a narrow 'monistic' notion of Reason as domination. While admitting the close interrelationship between the domination of internal and external nature, Habermas argues that these do not operate according to a single logic. He adopts a differentiated concept of reason in which instrumental rationality as the logic of domination of external nature necessarily 'aims at reification', while in the logic of communicative rationality, which governs inner nature, reification is not the aim but only a 'possible pathological outcome'. For Habermas the reification of external nature is *necessary* for the formulation of the objective technical rules that allow science and technology to manipulate the natural world. By contrast, in the development of inner or subjective nature, it is not a question of the creation of formal rules of technical control, but rather one of the internalisation of intersubjective *norms*. In other words, normative processes are aimed not at reification but at 'autonomy, individuation and socialisation', and as such they follow the logic of *communicative* rationality. (Whitebook, 1979 p.43)

By virtue of this differentiation of value spheres and their corresponding modes of rationality, [30] Habermas unlike Horkheimer and Adorno is able to maintain that the rationalisation of society is not inimical to moral progress and emancipation. On the contrary, the basis for the development of a society grounded in a free and democratic consensus is embodied in his notion of the 'ideal speech situation'.[31] The rational evolution of each aspect of the human self-

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with nature. For a discussion of Marcuse's attitude to science, see Alford (1985b) especially Chapter 4.

[29] This distinction (which has been drawn by Klaus Eder among others) is discussed in Chapter 3 of the current thesis. See also Rutherford (1999a).

[30] Parsons' comments that 'following Weber - and ultimately Kant - Habermas characterises modernity as the differentiation of three spheres of 'value': science, morality and art. These three spheres allow for the production of different forms of knowledge: scientific-technical, moral-practical, and aesthetic-practical.' (p.218) For a discussion of Habermas' reliance on Kant and Marx in his account of the relationship between human knowledge and nature, see Parsons (1992) p.218-230. See also Bernstein (1985) p.24. For a more sympathetic but nevertheless critical review of Habermas' use of Kantian notions in this context. See McCarthy (1978) p.110-125.

[31] As McCarthy points out, for Habermas 'the goal of critical theory – a form of life free from unnecessary domination in all its forms – is inherent in the notion of truth' and as truth, according to Habermas, is fundamental to communication, truth is therefore 'anticipated in every act of communication.' (McCarthy, 1978 p.7). West explains that for Habermas truth, freedom and justice 'are to be understood in terms of consensus theories of theoretical (factual

formative process (labour, communication and power), is immanent albeit in a distorted form, in the legal and political institutions and humanist values of modernity. Thus, moral progress is possible despite the over-importance of the technical/instrumental mode of rationality. Rather than terminating in the dialectic of enlightenment's conflation of power and reason, modernity needs to be pushed to completion, that is, social norms must be made fully rational, but in accordance with the appropriate mode of rationality - moral-practical reason. (Habermas, 1982b p.240) [32]

Habermas' treatment of the problem of nature must be understood within the context of his concern to rescue a rational basis for universal normative standards against the 'totalised critique' of instrumental reason advanced, following in the footsteps of Nietzsche and Weber, by Horkheimer and Adorno. (Habermas, 1982a p.19-23) The rejection of this form of critique is central to his project, which aims to maintain the critical role of social theory. In the hands of Horkheimer and Adorno critical theory looses its earlier aspiration of developing a critical social science directed towards fulfilling an explanatory-diagnostic role in furthering the task of human emancipation from domination and repression. In the Frankfurt School's formulation of the dialectic of enlightenment the emancipatory power of social science, itself an instance of 'identity thinking', is ensnared in the critique of instrumental reason. It cannot guarantee a solution to problems of rationalisation or modernity for it is part of the very mode of conceptual thought responsible for these problems.[33]

Habermas however seeks to ground his emancipatory critical theory through the reflexive use of social science. His re-formulation of critical theory is thus directed towards 'a non-positivist approach' to theory in the social sciences, rather than following Adorno's negative dialectics, which Habermas characterises as 'a renunciation of the social sciences'. (Habermas, 1981a p.10) While positivism denies the link between knowledge and interests (value), and therefore attempts to deny any rational warrant to moral-practical thought, Horkheimer and Adorno's totalising critique of instrumental reason likewise undermines practical reason by

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or scientific) and moral or practical truth (rightness). But a consensus is not valid if it is the result of inadequate information or external pressure or compulsion. … Discourse is to be measured against an 'ideal speech situation', which is free from relations of power or domination, and which is undogmatically committed to the consideration of all available evidence and even alternative conceptual schemes.' An ideal speech situation is not possible when ideology or power systematically distorts the rational force of 'the better argument'. A key task of critical theory is therefore to expose any such deviation from the ideal speech situation. (West, 1996 p.75-6) I argue in Chapter 5 that Habermas' view of the possibility of power free communication is based on an inadequate conception of power.

[32] See also Parsons (1992) p.218-9; Wellmer, (1985) p.50-2.

[33] Foucault makes a similar point about the complicity of the human sciences in modern forms of power. See for example Foucault (1980b) p.273-89.

assimilating value judgements to power. (Habermas, 1978 p.303; Habermas, 1982a p.22-3) Habermas' concern in this respect is to avoid the relativism (or perspectivalism) which he regards as inherent in Weber and the Frankfurt School's presentation of the processes of rationalisation. Instead he develops a theory of modernity that acknowledges the 'dialectic of social rationalisation' ('the main theme of the dialectic of enlightenment'). He also employs a theory of communicative rationality (or 'universal pragmatics') that 'possesses the analytical selectivity' needed to understand reification as a pathological phenomena arising from the deformed or partial realisation of the rational potential of modernity.

Habermas' theoretical development of critical theory therefore has been directed toward maintaining what he regards as this emancipatory potential of modernity. While this, in his view, has required the rejection of Horkheimer and Adorno's monistic notion of reason, it has also lead to his reconceptualisation of the idea of nature in accordance with this perspective. His treatment of nature has varied as his ideas have developed, and this can broadly be grouped into two phases, the first corresponding with his earlier formulation of the theory of cognitive interests, the second with his development of a universal pragmatics. In the first phase he relates different types of knowledge constitutive interests to the natural history of the human species, while in the later period he views problems of nature and ecology as expressions of the conflicts that arise at the interface of 'system' and 'life-world'. I shall consider in turn each phase of his work.

Nature and cognitive interests

Habermas' view of the relation between nature and society retains the Frankfurt School's understanding of nature as at the same time both the product of human history and the ground for that history. (Habermas, 1978) [34] His theory of cognitive interests appeals to a fundamental dialectical relationship between the human subject and nature.[35] He postulates a collective interest in utilising the forces of nature for the purpose of the reproduction and self-preservation of human society, and in doing so suggests a basic dependence on nature and at the same time, through knowledge, a separation from it.[36] This interest in self-

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[34] See also McCarthy (1978) p.113; Parsons (1992) p.222-5; Whitebook (1979) p.48.

[35] In Habermas (1978) - see Chapter 2 and Appendix - Habermas understands the subject as simultaneously possessing a human species-being and social-being, along the lines evident in Marx. See Marx (1974).

[36] 'Orientation toward technical control, toward mutual understanding in the conduct of life, and toward emancipation from seemingly 'natural' constraint establish the specific viewpoints from which we can apprehend reality ... By becoming aware of the impossibility of getting beyond these transcendental limits, a part of nature acquires, through us, autonomy in nature. ... the mind can become aware of its natural basis reflexively.' (Habermas, 1978 p.311).

preservation is embedded in the natural history of the human species and gives rise to particular 'knowledge-constitutive interests'. The most significant point about this claim is that knowledge is not separate from the wants and needs of human beings, as traditional epistemology would have it, but is based in 'the metalogical necessity of interests that we neither prescribe nor represent, but with which we must instead *come to terms*.' (Habermas, 1978 p.312 - original emphasis) Thus Habermas emphasises that what is taken as factual knowledge (or 'objective knowledge') reflects the success or failure of collective actions, lying behind which is the interest in self-preservation giving rise to the interlocking of knowledge and interests from the 'life-world'. His view of knowledge therefore exhibits the characteristics of philosophical pragmatism.

Following from his differentiation of reason and 'value spheres' as an antidote to the Frankfurt School's totalising notion of reason, Habermas posits three types of knowledge-constitutive interests: the technical, the practical and the emancipatory. (Habermas, 1978 p.308-310) According to this schema the technical interest is that which governs human relations with nature, where the interest is an *instrumental* interest in control and exploitability, of pragmatic utility in securing the satisfaction of needs and wants brought forth in the natural history of the human species. This natural history lies behind and is inseparable from social and cultural processes. It gives rise to taken-for-granted ('natural' and 'instinctual') needs and motivations, but at the same time these are also historically and socially shaped so that they transcend 'mere self-preservation'. That is, even the apparently *natural* interest in self-preservation is expressed through the *social system* as the means of securing a '*historical* existence' against nature.[37]

The idea that interests are constitutive of knowledge means that humans can only experience the world ('reality') as conditioned through these interests, and additionally that knowledge would not be possible unless interests existed. This means that interests have a cognitive function of constituting what it is possible to have knowledge of, that is, they create 'fundamental object domains'. (Habermas, 1978 p.369) [38] Interests therefore structure the possible viewpoints from which the human species can apprehend reality. Habermas further argues that knowledge-constitutive interests '*take form in the medium of work, language and power*', that

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[37] 'the human interests that have emerged in man's natural history … derives both from nature and from the cultural break with nature. ... What may appear as naked survival is always in its roots a historical phenomenon. For it is subject to the criterion of what a society intends for itself as the good life.' (Habermas, 1978 p.312-3)

[38] There is a similarity between this and the notion of 'problematisation' evident in the work of Foucault and others on governmental rationality, and in the work of Latour and other actor-network theorists. Both are discussed in detail in subsequent chapters.

is, each of these media shape interests in distinct ways and corresponds to the different types of knowledge.[39]

Habermas reconstructs Marx's differentiation of nature into three moments - *nature-in-itself*, *subjective nature* and *objective nature*. Nature-in-itself is conceived, following the early Marx, (Marx, 1974 p.329-30) [40] as that which exists prior to the cultural world, as the basis of the natural evolution of the human species in a biological sense. In addition to this naturalistic sense of extra-human nature, Habermas also understands nature-in-itself as an epistemological necessity, which presupposes nature as existing of itself, independently of human history and experience[41]. This is nevertheless 'an abstraction', for nature must always be encountered within the context of the socio-historical 'self-formative process' of the human species. (Habermas, 1978 p.34)

In its anthropological aspects, Habermas further divides nature analytically into 'the *subjective nature* of man and the *objective nature* of his environment.' 'Subjective bodily nature' consists not only of the characteristics 'of an organism dependent on its environment (sensuous receptivity, need, emotionality, vulnerability)' but also the 'adaptive modes of behaviour and active expressions of life of an 'active natural being.' Central to the human self-formative process is social labour, which is both a 'natural' process through which humans exchange materials with their environment and at the same time a 'transcendental' act through which the conditions for the constitution of objective knowledge of external nature are brought into being. (Habermas, 1978 p.26-8) In the labour process subjective nature is mediated with external environmental nature. Habermas argues that humans are thus able to gain 'access to nature' only through the 'historical dimension disclosed by the labour processes', that is, through purposive-material interaction with the natural world. (Habermas, 1978 p.34)

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[39] The three 'categories of possible knowledge' are: that which 'expands our power of technical control' (instrumental); that which 'makes possible the orientation of action within common traditions' (practical); and that which 'free consciousness from its dependence on hypostatised powers', ie social and psychic constraints (emancipatory). These types of knowledge 'originate in the interest structure of a species that is linked in its roots to definite means of social organisation: work, language, and power. The human species secures its existence in systems of social labour and self-assertion through violence, through tradition-bound social life in ordinary language communication, and with the aid of ego identities that at every level of individuation reconsolidate the consciousness of the individual in relation to the norms of the group.' (Habermas, 1978 p.313)

[40] There is clearly an attempt to combine Marx and Kant in Habermas' account of nature, for example see (Habermas, 1978 p.25-6, 35). For a detailed consideration of this aspect see (Parsons, 1992).

[41] This serves a similar function to Kant's thing-in-itself, as something which cannot be known as such but which is postulated as lying behind the appearances confronted by the senses. See Habermas (1982b) p.241-3; McCarthy (1978) p.110-25; Parsons (1992) p.221-6; Whitebook (1979) p.48-9.

Hence objective nature is *not* identical to nature-in-itself but is constituted 'only in being mediated by the subjective nature of man through processes of social labour'. (Habermas, 1978 p.28) [42]

Habermas suggests that objective nature is not simply a creation of the subject, but the synthetic product of the subject's activity in attempting to transform, control and utilise external nature (nature-in-itself). According to Marx there is both a unity of humans and nature, and a struggle between the two, which exists in the process of material production (social labour), and through which both nature and the labouring subject are transformed. (Marx, 1976 p.283) [43] Following this approach, Habermas argues that the unity or synthesis between the subject and nature is only brought about by the activity of the subject, and is therefore necessarily something forced on to nature by the subject. Objective nature however does not exist in isolation from nature-in-itself. While the activity of the subject constitutes objective nature, it does not do so at will but encounters resistance: there exists an 'independence and externality' to nature that resists the subject. As a consequence, the unity of humans with nature 'cannot eradicate the autonomy of nature and the remainder of complete otherness that is lodged in its facticity', regardless of the scientific-technical power brought to bear. (Habermas, 1978 p.33) It is important to understand that in talking of objective (or objectified) nature, Habermas is referring to the *constitution of nature as an object of instrumental action or scientific knowledge*, that is, as *an object of experience*. (Habermas, 1978 p.323 - translator's note 23) Objectified nature then, consists of 'possible objects of experience' and as such shares both the independence and externality of nature and the 'produced objectivity' of a *Lebenspraxis* (world-constituting life activity or social practice). (Habermas, 1978 p.27-28)

Habermas claims his use of the concept nature-in-itself is an 'ironic' reuse of Kant's thing-in-itself. He thus points to the pragmatic necessity of recognising the contingency and resistance of an independent reality which we are forced to construe as existing along the lines of nature-in-itself, even though this nature can only be scientifically known to us 'as objectivated.' (Habermas, 1982b p.242) Habermas' twofold characterisation of natural objects as possessing the qualities of both being-in-itself and humanly produced objectivity is captured in his assertion that reality can only be known 'in the perspective of possible technical control.' (Habermas, 1978 p.130) What he is saying is that reality or nature is both *disclosed* and *constituted*. It is constituted to the extent that the *meaning* of statements we make about nature and the properties we assign to nature, 'must be understood in relation to the structure of instrumental action.' Nature is disclosed

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[42] Habermas takes labour to include science and technology. Both are 'work' in the Habermasian sense.

[43] For a discussion of the problem of nature and ecology in Marx see Grundmann (1991a) and (1991b).

inasmuch that statements about nature must have a pragmatic utility, that is, they must accommodate the resistance of nature to 'false interpretations'. The facticity ascribed to nature in statements must be construed as existing independently of human action, as nature-in-itself. McCarthy argues that this approach allows Habermas to avoid some of the difficulties of interpreting nature-in-itself as strictly a Kantian thing-in-itself, for under Habermas' re-formulation, nature-in-itself is no longer completely unknowable. Nature-in-itself is knowable to the degree to which it can be subjected to instrumental action or technical manipulation; that is, it is knowable 'subject to the conditions of possible objectivity', to the degree to which nature is *objectified*. (McCarthy, 1978 p.117)

Habermas clearly understands subjective nature as including the fundamental social life-structures, work and interaction. Here again there is a paradox, for if nature can be known in the context of instrumental action then it follows that 'subjective bodily nature', inasmuch as it is known through instrumental means, must also be understood as part of objectified nature.[44] However, this same subjective bodily nature would (in a consistently materialist ontology) need to exist prior to constituted objectivity. The dilemma is then, that 'either subjective bodily nature is not a prior condition of possibility of cognition, or it is and we cannot know it.' (McCarthy, 1978 p.119) Habermas attempts to overcome this problem by differentiating the conditions under which human knowledge of objective and subjective nature is achieved. Thus while objective nature is constituted in the context of instrumental action, subjective nature can only be understood, according to Habermas, within the media of the 'reproduction of social life' (work or social labour) and the 'cultural conditions' in which it takes place (interaction). Unlike objective nature, subjective nature cannot be understood within the same objectifying framework as biological reproduction and preservation of the species. Work and interaction are elements of a self-formative process that includes 'learning and arriving at mutual understanding.' (Habermas, 1978 p.196) Subjective nature is therefore to be understood as bound to these structures of social action (work and interaction) and the knowledge constitutive interests that lie behind them. These are to be understood not as the product of an objectifying process but of a reflexive or hermeneutic task, which reflects on the *conditions of objectivity*:

> In an epistemological context, then, subjective nature refers neither to an unknowable nature-in-itself nor to an objectively constituted nature. It refers to structures of human life that are grasped reflectively in an attempt to elucidate the nature, conditions, and limitations of human knowledge. (McCarthy, 1978 p.120)

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[44] There is some similarity here with Foucault's approach to the human body. See Butler (1989).

One of the tasks of Habermas' cognitive interest theory is to overcome what he sees as Marx's epistemological conflation of symbolic interaction and labour. (Habermas, 1978) He attempts to do this by arguing that these separate domains of action are based on different categories of knowledge that obey different logics or rules of formation. (Habermas, 1978, Appendix; Habermas, 1982b) Labour, as Parsons notes, is nevertheless defined by Habermas 'in terms of *dual character*: as both a category of human existence and an epistemological category.' (Parsons, 1992 p.222) [45] Nature and labour therefore come together in a specific way in Habermas - through science and technology. For him science and technology are highly rationalised expressions of social labour. Indeed, Habermas makes a direct link between the 'old' techniques of labour (*techne*) characteristic of artisan production in the past and modern technology. He argues that the

> function of the knowledge of modern science must therefore be understood in connection with the system of social labour: it extends and rationalises our power of technical control over the objects or - what comes to the same thing - objectified processes of nature and society. (Habermas, 1976 p.334)

Science and technology are therefore modern expressions of the same cognitive interest as is labour, that is, the instrumental or technical interest in the *effective manipulation and control of nature and the social organisation of labour necessary for this*. Whereas Horkheimer and Adorno understood science and technology as expressions of the objectifying tendency characteristic of *all* conceptual reason, Habermas insists on a differentiation. The problem of nature (insomuch as there is a problem) therefore does not arise from the 'new function of science as a technological force', but rather from a failure to separate 'practical and technical power'. The difficulty is precisely that the different value spheres and cognitive interests are not adequately distinguished, resulting in 'the process of scientification' transgressing the proper limits of technical rationality and intruding into areas of moral-practical reason, that is, politics. (Habermas, 1976 p.331-4) [46]

One of the main strengths of Habermas' interpretation of science is his insistence that knowledge of nature cannot be separated from human interests and their historical production. Thus contrary to the ahistorical orientation of

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[45] See Habermas (1978) p.28-35. It is not within the scope of this thesis to consider in detail the bases from which Habermas draws his theory in this regard. For discussion and criticism of Habermas' attempt to synthesise Kant and Marx see Parsons (1992) p.218-30; McCarthy (1978) p.110-25; Whitebook (1979) p.41-69.

[46] This is an issue that is also taken up by Beck. See in particular (Beck, 1994) where he in effect argues for a politicisation of decisions about technology - he asserts that the acceptability of technological risks is a moral-practical one rather than a technical one. Beck's work is discussed in Chapter 4 of this thesis.

positivism and the totalising tendency of Horkheimer and Adorno, Habermas attempts a historically based account of the relation between knowledge and nature. However, his own tendency to seek a universal grounding for reason undermines this. This is particularly the case with his argument that the technical cognitive interest is a product of *the* natural history of the human species, and that 'our' technology as an expression of this must be conceived as a project of 'the human species *as a whole*.' (Habermas, 1971 p.87) Such a homogenous view of 'natural history' and social evolution is as totalising in its own way as the 'monistic' notion of reason put forward in Horkheimer and Adorno's Dialectic of Enlightenment. The desire to secure a universal foundation, or more precisely, universal criteria for assessing validity claims, is evident in key aspects of his cognitive interest theory, and later in his theory of communicative action.

Habermas argues cognitive interests give rise to a universal or 'quasi-transcendental' perspective, in that they are directed at satisfying universal interests of the human species in self-preservation. These interests are however historical in that they have evolved in the 'natural history of the species', but take on an almost transcendental character in the way in which they provide a universal and necessary horizon within which knowledge of the natural and social world is possible. (Habermas, 1974 p.8, 21) As Alford comments, this 'seems to mean that each interest sets the conditions under which the possible objects of experience can be known, but interests do not constitute the objects themselves.' (Alford, 1985b p.80) Thus while on the one hand Habermas appears to want to assert that knowledge is only possible within a historical context, he also seeks to retain the notion of 'objective' knowledge of the natural world. This is very much tied to his rejection of the Frankfurt School's version of the critique of instrumental reason. In emphasising the differentiation of reason, Habermas wants to retain the claim of the pragmatic-technical usefulness of natural science while at the same time quarantining politics and ethics from the objectifying logic of those sciences. Unlike the natural sciences, the human sciences express the cognitive interest in the development of intersubjective understanding that allows agreement on moral-practical issues as a necessary means for orienting social actions. The human sciences, in Habermas' view, are fundamentally linked to political and moral discourse, and involve interpretation and criticism directed towards hermeneutic understanding of social interaction. Science and technology, as forms of labour, are directed towards the technical mastery of external nature in the interest of self-preservation of the species, while the human sciences are directed towards understanding subjective nature and the realisation of human emancipation and autonomy. (Habermas, 1971 p.87-93) Habermas thus asserts, contrary to Horkheimer and Adorno, that the mastery of external nature need not lead to the subjugation of 'inner nature', that is, there need be no necessary link between an advanced science and technology and social domination.

Having made this separation between the natural and the social, Habermas reinstates the notion of 'objective' or decontextualised knowledge of nature, for while the cognitive interest in technical control of nature is the product of history, it is the nevertheless the product of a *common natural history of the entire species*. This suggests that while the technical interest in the control of nature is the result of an evolutionary history, the *species* share a common interest in self-preservation through mastery of nature. The 'transcendental ego' is naturalised in the biological notion of species, and through this step Habermas attempts to rescue the notion of the objectivity of the natural sciences, contrary to Horkheimer and Adorno's assimilation of knowledge to power.

As noted earlier, Habermas argues that we are forced to 'construe nature as something existing in itself, though it is scientifically accessible to us only as objectivated.' He also claims that nature, as 'a contingently existing reality independent of us' resists 'false interpretations'. (Habermas, 1982b p.242) It must be asked, however, what is it that 'resists'? It cannot be said that it is nature-in-itself for as Habermas insists, this cannot be known other than as objectified. The 'independence' of nature is therefore the resistance offered by objectified nature, not external nature-in-itself, to which we have no access. It must be remembered that objective nature in Habermas' account is constituted through the process of social labour, which includes scientific theorising. (Habermas, 1978 p.34) The consequence of this is that what guarantees the objectivity of scientific knowledge of nature is not the realities of nature-in-itself but the *activity of objectification.* In other words, the independence and externality of nature, which Habermas says we must construe as an 'epistemological postulate', cannot act as a measure of the objectivity of technical-scientific knowledge. Instead objectivity is the 'produced objectivity' of social practices. (Habermas, 1978 p.27-36) [47] In this circumstance Habermas' attempt to draw a rigid division between instrumental and practical knowledge, between the natural and the human sciences must be questioned.[48]

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[47] This is not that far from the approach taken by actor-network accounts of how science 'constructs' nature. Actor network theory is discussed in Chapter 8 of this thesis. See also Latour (1987).

[48] Habermas does of course acknowledge that theory formation in the natural sciences is subject to hermeneutic influences, as pointed to by 'post-empiricist' philosophy of science such as Popper, Kuhn, Lakatos, Feyerabend *et al*, [see (Habermas, 1984 p.107-11)] inasmuch as data and facts cannot be described independently of theoretical languages and paradigms within which observation statements are formulated and interpreted as meaningful. So, while the natural sciences cannot be interest free or 'objective' in a positivist sense, they nevertheless do not obey the same logic involved in communication. The natural sciences still obey an instrumental-objectifying logic directed at manipulation and control of nature (expressed in labour) while the human sciences are thoroughly communicative or 'doubly hermeneutic' [see (Habermas, 1984 p.110)] in that they are governed by a logic or practical interest in the reproduction of intersubjective, mutual understanding that orientates social action. See Rouse, (1987), Chapter 6 for a detailed discussion and critique of Habermas' under-estimation of the hermeneutic character of natural scientific knowledge. I will return to a more extensive discussion of this

Communicative action

Habermas' project, even in his early works aims to develop a systematic theory of social rationalisation in a way that will explicate the 'pathology of modernity from the viewpoint of the realisation - the deformed realisation - of reason in history.' (Habermas, 1981a p.6-7) Habermas' Knowledge and Human Interests is an attempt to develop such a theory of rationality capable of giving a rational basis for universal normative standards in the struggle for emancipation. In this work Habermas derives an emancipatory interest from self-reflection on the technical and practical cognitive interests. (Habermas, 1978, Appendix p.314-5, and Postscript p.370-6) Here Habermas' thrust is primarily epistemological in that he is concerned with the ways in which critical self-reflection on the connection between knowledge and interests can be grounded on an emancipatory critical theory of society. For a variety of reasons Habermas came to see the approach adopted in Knowledge and Human Interests as suffering from shortcomings. (Habermas, 1978, Postscript) [49] Principal among these was the failure of his cognitive interest theory to sufficiently extricate itself from the epistemological orientation of the 'philosophy of the subject'. Habermas argues that in such a philosophical orientation the focus remains on the way in which autonomous subjects relate to the objects in the world rather than on how subjects are constituted and formed in social interactions based on communication. (Habermas, 1985) [50]

While Habermas moved away from use of 'quasi-transcendental' cognitive interests he nonetheless retained some of the key distinctions embodied in his earlier theory. The earlier distinction between technical interests and

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argument in Chapter 6 of this thesis where I criticise Foucault for his tendency to assign a more 'objective' character to the natural sciences than he does to the human science, and thus separate science from the critique of power. See also Latour's criticism of Foucault (in Crawford, 1993) on similar grounds – this is discussed in Chapter 8 below.

[49] See Bernstein (1985) p.11-25 for an elaboration of these shortcomings.

[50] Chapter 11 of that work in particular deals with these issues. Here Habermas claims that '*Rationality* refers in the first instance to the disposition of speaking and acting subjects to acquire and use fallible knowledge. As long as the basic concepts of the philosophy of consciousness lead us to understand knowledge exclusively as knowledge of something in the objective world, rationality is assessed by how the isolated subject orients himself to representational and propositional contents. Subject-centred reason finds its criteria in standards of truth and success that govern the relationships of knowing and purposively acting subjects to the world of possible objects or states of affairs. By contrast, as soon as we conceive of knowledge as communicatively mediated, rationality is assessed in terms of the capacity of responsible participants in interaction to orient themselves to validity claims geared to intersubjective recognition.' (p.314). From this it is clear why Habermas would consider his cognitive interest theory fails to overcome the perspective of the philosophy of the subject - in Knowledge and Human Interests the focus is still firmly on the relationship between knowledge and purposive-instrumental reason.

practical/emancipatory interests is reformulated in its most systematic fashion in Theory of Communicative Action. (Habermas, 1984; Habermas, 1987) In particular, this later work retains a fundamental categorical distinction between purposive-rational action and symbolic or communicative action. Whereas his cognitive interest theory attempts to ground a universal emancipatory interest in the natural history of the human species, his theory of communicative action (or universal pragmatics) seeks a universal foundation for emancipatory critique in the structure of the human speech act and communication in general. There is therefore a 'linguistic turn' from natural history to language as the means of grounding the rejection of various 'forms of relativism' and 'irrationalism in general' that he sees as appearing 'under the sign of a dubious revival of Nietzsche'. (Habermas, 1981a p.12) [51] Thus Habermas now bases his theoretical perspective on the notion of communicative action as a uniquely human form of social action based in language and in his formulation, directed intrinsically towards mutual understanding and consensus. However this new grounding for emancipatory critique remains, as with his earlier theory, dependent on the 'natural' characteristics of the human species, in this case language.

Habermas' theory of communicative action provides a perspective in which the 'cognitive-instrumental mastery of an objectivated nature (and society)' is understood as a process that derives from the separation of instrumental reason from a 'suppressed' practical reason, that is, in its separation from the 'communicative structures of the life-world'. For Habermas the notion of communicative reason retains the comprehensive or emphatic concept of reason (that Horkheimer and Adorno's idea of instrumental reason undermines) by postulating a rational potential inherent in speech acts which he regards as possessing a discursive logic aimed at achieving a non-coercive, rational consensus among participants. In Habermas' later work the communicative potential of reason becomes the effective principle behind the processes of social modernisation, albeit a potential that is 'simultaneously developed and distorted' by modernity. (Habermas, 1987 p.315) While in one sense Habermas' notion of communicative reason has a 'purely procedural character' (and thus retains a 'quasi-transcendental' element), it is also understood by him as implicit to actual social processes as these assume and necessitate mutual understanding and consensus among social actors. Indeed, Habermas argues that the communicative potential of reason derives from the everyday life-world with its taken for granted cultural context providing the basis for processes of mutual understanding. The rationalisation of the modern life-world, through the differentiation of spheres of social action and the division of labour, is an inevitable (and positive) element of modernisation. However this process, according to Habermas, is distorted by the

[51] Habermas is no doubt referring here not only to Horkheimer and Adorno, but also to Heidegger, Foucault, Derrida *et al.* See Habermas (1985) for elaboration of his critique of these theorists.

'unfettered imperatives of (the) economic and administrative' system, which embodies a functional logic that suppresses questions of practical reason. (Habermas, 1987 p.315-6) Thus the 'natural' life-world in which communicative reason originates is 'uncoupled' from the economic and administrative system of modern society. The functional or purposive logic of this system then comes to dominate and distort the communicative-practical processes of society. It is in this context that Habermas talks of the need to complete the 'unfinished project' of modernity, that is, he argues that the full potential of communicative reason can only be realised by re-establishing the proper relations between moral-practical decisions and strategic-purposive ones *within* the economic and administrative system.

System and lifeworld

In Theory of Communicative Action, Habermas' response to what he regards as the 'dead end' into which the Frankfurt School had taken critical social theory, as well as to his own earlier inadequate attempts to overcome these, is twofold. The first, as discussed above, is to further develop his earlier critique of Horkheimer and Adorno's one dimensional notion of reason through the use of a linguistically based concept of communicative action linked to the notion, derived from phenomenology and interpretative sociology, of the lifeworld. The second is an attempt, developed in detail in volume two of Theory of Communicative Action, to integrate this hermeneutic-phenomenological concept of the lifeworld with the approach of systems theory derived from Talcott Parsons. (Habermas, 1987) An important feature of this reorientation is the shift of focus from the differentiation of action spheres (instrumental, practical, emancipatory) to an emphasis on the analysis of two distinct modes of *action coordination*. With this change Habermas now gives a central role to communicative reason (at the expense of cognitive interests) as providing both the 'internal logic' and coordinating mechanism for the rational reproduction of the symbolic content of the lifeworld. The material reproduction of society is now conceived as being coordinated through the 'system media' of money and power within the social 'sub-systems' of the economy and the administrative state. (Habermas, 1987 p.250-77; Smith, 1993 p.107)

In the tradition of interpretative sociology (ie Schutz, Luckman) the notion of the lifeworld refers to the pre-given stock (or horizon) of background knowledge and values that individuals draw on as interpretative resources for the orientation of action in social contexts. Habermas is critical of the 'individualising' and 'culturalistic' implications of this approach and instead argues that rather than viewing action from the perspective of the individual actor it is necessary to understand the existence of the lifeworld in collective terms. (McCarthy, 1984 p.xxiv-xxvi) In doing this, Habermas insists that the institutional order of society must be considered an important structural element of the lifeworld. The argument

here is that the existence and reproduction of this institutional order (which includes institutional production of *norms*) is essential to a stable lifeworld. The existence of an institutional, norm producing, order is therefore vital in '*coordinating*, even *constituting*' the everyday contexts within which social actors pursue their activities. (Baxter, 1987 p.46-7) [52]

Habermas argues that modernisation is the result of a process of social differentiation and rationalisation that occurs on two levels simultaneously. He combines hermeneutic and systems perspectives to view society simultaneously as both as a lifeworld and a self-regulating system. In the former, solidarity or *social integration* is based on the cultural coordination of the *action orientations* of individuals through communicatively negotiated normative agreement and legitimation. In the latter, *functional integration* is brought about via the coordination of the *action consequences* in a way that contributes to the maintenance of the institutional order or social system. (Habermas, 1987 p.117) Habermas claims that social integration manifests itself as the symbolic reproduction of the lifeworld, and is dependent on processes of socialisation and cultural tradition. On the other hand, functional integration, according to Habermas, is 'equivalent to a material reproduction of the lifeworld that is conceived as system maintenance'. Such functional integration or systemic 'interdependency', while requiring the social integration based on the symbolic reproduction of the lifeworld through communicative reason, goes beyond the 'communicative intermeshing of action orientations', that is, 'the system' has a degree of structural autonomy. By introducing this systems approach Habermas thus emphasises that system integration is not the intended result of mutual cooperation but must be understood as the unintentional expression of latent systemic tendencies or functions. He argues that this systemic coordination of actions is not comprehensible from a social actor's 'intuitive knowledge of lifeworld contexts'. Rather 'survival imperatives require a junctional integration of the lifeworld, which reaches right through the symbolic structures of the lifeworld and therefore cannot be grasped without further ado from the perspective of participants.' (Habermas, 1987 p.232-3) These survival imperatives are those of the human *species*. The material reproduction of society requires

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[52] Habermas identifies three structural components of the lifeworld - culture, personality, and society [or what Baxter and McCarthy call 'the institutional order'; see Baxter (1987) p.47 and McCarthy (1984) p.xxiv. Habermas explains that 'By culture I mean the stock of knowledge upon which participants in communication draw in order to provide themselves with interpretations that will allow them to reach understanding ... By society I mean the legitimate orders through which participants in communication regulate their membership in social groups, and thereby secure solidarity. Under personality I understand the competences that make subjects capable of speech and action, and thus enable them to participate in processes of reaching understanding, and thereby assert their own identity.' [Baxter (1987) p.47-8 quoted from the German 1981 Theorie des kommunikativen Handelns, Band 2: Zur Kritik der funktionalistischen Vernunft p.204-5].

system (functional) integration, and in this sense social reproduction is 'fundamentally dependent upon the appropriation of natural resources' needed to maintain the material conditions of biological life. (Honneth, 1991 p.290-1)

It is against this methodological orientation that Habermas develops his view of modernisation as a two-level process of rationalisation. At the first 'level', he sees what he calls the uncoupling of the system from the lifeworld, in which the means of functional integration (the sub-systems of economy and state) become increasingly autonomous from those elements of the lifeworld responsible for social integration. In other words, the institutional order is increasingly differentiated from culture. At the second level Habermas sees a process of growing differentiation and rationalisation *within* both the lifeworld and system themselves. (Habermas, 1987 p.153-4) [53] Rationalisation of the lifeworld occurs through the growth of modern society's reliance on 'discursive will formation' in which the values or normative statements that legitimate social practices become dependent on formal, 'rational' procedures for their justification rather than the authoritative invocation of cultural tradition.[54] At the same time the means of material reproduction of society become more complex, requiring a greater degree of division and coordination of social labour. This process is driven by the increasing complexity (and productive capacity) of economic exchange in industrialised society and necessitates a corresponding expansion of the administrative capacity and organisational power of the state directed toward the purposive-rational efficiency of economic exchange and administrative actions. (Habermas, 1987 p.153-197) [55]

These processes of rationalisation however pull in two directions. On the one hand they increase the *potential* for communicative rationality, while at the same time the rationalisation and autonomisation of the mechanisms of functional integration of the system tends to free ('uncouple') instrumental activity from the normative restraints traditionally imposed by the cultural lifeworld. Thus against the potential of modernisation to realise the communicative rationalisation of the lifeworld, there is the tendency (realised in advanced industrial society) for the functional elements of the institutional order ('the system') to replace normative communication as the means of coordinating social actions. From the perspective

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[53] See also McCarthy (1984) p.xxviii; Baxter (1987) p.70-1.

[54] Indeed, Habermas claims that even the reproduction of cultural tradition 'becomes more strongly dependent upon the capacity for critique and innovation'. It thus embodies a much greater possibility of arriving through rational argumentation at mutual agreement on claims to truth and normative validity which is reflected in the institutionalisation of scientific research, modern legal practices and democratic political representation. Habermas translated by Baxter (1987) p.49, from Theorie des kommunikativen Handelns II 1981, p.219-20. See also Habermas (1984) p.70-1.

[55] See also McCarthy (1984) p.xviii-xxiv).

of the sub-systems of the economy and the state, this gives rise to the situation in which the 'steering media' of money and power develop into 'formally organised domains of action'. (Habermas, 1987 p.307) Rather than being embedded in the appropriate lifeworld domain of communicative action, according to Habermas these steering media represent a form of strategic action that not only uncouples itself from the lifeworld, but also develops an '*irresistible inner dynamic*' that leads to the '*colonisation of the lifeworld*'. (Habermas, 1987 p.331 - emphasis in original) In particular, Habermas points to the way in which such 'norm free' strategic action parallels in the social world the methods employed for dealing with 'scientifically objectivated nature'. Indeed, he argues that strategic or purposive-instrumental action is freed of 'normative restrictions to the extent that it becomes linked to flows of information from the scientific system.' (Habermas, 1987 p.196)

Nature in communicative action theory

In his earlier cognitive interest theory, while locating the generalised interests of the human species in its natural history, Habermas nevertheless was concerned to separate the social from non-human nature. As we have seen, he does this by arguing that there are different types of cognitive interests, and that these reflect a fundamental divergence between the different realms of human activity, that is, between social labour and symbolic interaction. He also claims that these different cognitive interests constitute distinct 'object domains' which each obey different logics. (Habermas, 1978 p.369) These differences are in turn reflected in the character of the methods of knowledge production, that is, between the objectifying methods of the natural sciences and the hermeneutic methods of the human sciences. In adopting this approach Habermas rejects Horkheimer and Adorno's call for reconciliation with nature, which he sees as regression into a religious or metaphysical worldview that undermines the positive achievements of modern scientific knowledge and politics. Nature, Habermas insists, can only usefully be known as an object of control. (Habermas, 1982a; Habermas, 1982b)

Habermas' attitude towards nature has not only been the subject of a debate between Habermas and members of the Frankfurt School, [56] but has also drawn criticism from a range of writers more directly concerned with ecological problems. [57] Their key criticism is that Habermas' theoretical differentiation of

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[56] This was an important issue of debate between Habermas and Marcuse, in which Habermas (1971, p.85-6) attacked Marcuse's notion of a 'new science'. See Alford (1985b) for a detailed study of these differences.

[57] In this respect the main works are Leiss (1975), DiNorcia (1974) Alford (1985a; 1985b), Whitebook (1979), Ottmann (1982), Eckersley (1990; 1992), Parsons (1992). See McCarthy's comments (1978 p.112-125), and the response to much of the substance of these criticisms by Habermas (1982b) especially Section III - Reason and Nature: reconciliation at the cost of re-enchantment', p.238-250.

cognitive interests (and the corresponding differentiation of spheres of rationality) is drawn with such *rigidity* that it denies the possibility of knowledge of, or relations with, nature except insofar as this is mediated by an objectifying interest in technical control. Habermas' approach to nature is considered by most of these critics as being too narrowly conceived to be capable of adequately dealing with the ecological and ethical issues posed by the environmental problems facing contemporary society. In particular, Habermas' theory is attacked for being 'thoroughly anthropocentric' (Whitebook, 1979 p.52) in that it appears to exclude the possibility of communicative interaction with nature, that is, it constructs the distinction between technical and practical interests too rigidly. Ottmann, for example, suggests that given the severity of modern ecological problems it may be necessary to recognise that the human species has an interest in nature beyond mere technical control. Indeed, a normative relationship to nature should be considered an integral part of the human practical interest in 'the good life'. (Ottmann, 1982 p.89-92) Eckersley (1992) mounts a similar argument. [58]

Habermas generally rejects these criticisms on the grounds that nature cannot enter into the sorts of relations of mutual understanding and recognition that takes place between *subjects*, and which he regards as characteristic of relations founded on communicative reason. (Habermas, 1978 p.33) In other words, nature is incapable of entering into discursive or dialogical relations as a 'partner in communication' as are humans.[59] He questions how any attitude other than the 'objectivating attitude of the natural-scientific experimenting observer' can be 'theoretically fruitful' in the sense of leading to a pragmatically successful manipulation of natural resources required for the material reproduction of society. He also rejects the idea that a 'naturalistic ethic' could be 'adequately grounded' today without recourse to religious or metaphysical outlooks that would undermine the 'level of learning attained in the modern ie scientific understanding of the world.' (Habermas, 1982b p.242-3, 248) This is the crux of Habermas' defence - that *useful* knowledge of nature is only available through the objectifying medium of social labour (particularly science and technology), and that a 'nature' ethic would undermine the cognitive achievements that flow from the disenchantment and rationalisation of society brought about by modernity. Thus the real issue for Habermas' in his debate with these critics is the question of under what conditions can we know nature and which of these ways of knowing

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[58] See p.112-4.

[59] While this is challenged on largely ethical grounds by the critics discussed here, Bruno Latour argues against this assertion on somewhat different sociological, or more accurately, 'actor-network' grounds. Latour questions whether the 'modernity' that Habermas seeks to defend has ever really existed, that is, whether the separation of the human and non-human assumed by Habermas is ontologically possible. (Latour, 1993 p.60-1) I argue that Latour and actor-network theory provides some useful elements for a (largely sympathetic) critique of Foucault - see Chapter 8 of this thesis.

nature are useful to human beings in a pragmatic sense? As we have seen, his response to this is an emphatic insistence that functionally useful knowledge of nature can only be acquired through the objectifying, 'decentred attitude' of modern science. (Habermas, 1982b p.248) [60] The intricacies of this debate, and especially the philosophical response of Green theorists, are outside of the scope of the present discussion.[61]

However it is clear that the development of the theory of communicative action does little to alter Habermas' basic conceptualisation of the relation between nature and society. If anything the move to the 'paradigm of linguistic philosophy' (Habermas, 1987 p.390) strengthens his emphasis on the intersubjective relations by privileging social over material reproduction. In another sense however, the move to systems theory makes the relation to nature *less* problematic. This arises out of Habermas' criticism of Weber's and the Frankfurt School's notion of reification (or the absolutising of purposive-instrumental rationality in the interests of human self-preservation) as being bound to the philosophy of the subject. (Habermas, 1987 p.399) Habermas claims that the 'problem of reification' should be understood not so much as the reification of consciousness as the result of an 'unleashed functionalist reason of system maintenance' which overrides and distorts the fundamental communicative processes of 'sociation' responsible for the symbolic structuring of the lifeworld. (Habermas, 1987 p.392) He argues that the maintenance of society is not simply dependent on technical mastery of external nature or on the strategic relations between social groups. It also requires the coordination of societal activities through communicative action, which can only be brought about in accordance with the 'conditions of rationality' inherent in this. By introducing

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[60] From an epistemological perspective Habermas denies that it is possible to have direct, unmediated access to nature-in-itself at the level of rationally reconstructive knowledge (ie as theoretical knowledge). However, he does concede that some form of 'private access' to nature-in-itself 'guided by a pre-understanding of the lifeworld specific to humans' may be possible. But he insists that such a 'performative attitude to external nature' can only allow humans to enter into communicative relations with nature via 'aesthetic experience and feelings analogous to morality'. (Habermas, 1982b p.242-4) Nevertheless, this is still not a genuinely communicative relation in the sense of a linguistically shared intersubjectivity. This would depend on the possibility of argumentatively challenging validity claims between linguistically competent subjects (ie 'the comprehensibility of the symbolic expression, the truth of the propositional content, the truthfulness of the intentional expression, and the rightness of the speech act with respect to existing norms and values.' [Habermas quoted in Bernstein (1985, p.19-20).] The extent to which a non-instrumental relation with nature is possible is in any case limited by the specifically human pre-understandings of the lifeworld, which relies on human communicative action. A similar line of argument is followed by Habermas with regard to ethical theory where he maintains that ethics must be based on a discursive 'norm-conformative attitude' in which 'the principle egalitarian relation of reciprocity built into communicative action ... cannot be carried over into relations between humans and nature.' (Habermas, 1982b p.248)

[61] See Eckersley (1990) for a summary of the key arguments in the Green critique.

this 'communications-theoretic turn' (Habermas, 1987 p.392) as the keystone of his later social theory, Habermas seeks to provide a universal and fundamental grounding for emancipatory critique that the philosophy of the subject is unable to defend from the reifying effects of social rationalisation. He thus claims to revive the comprehensive notion of Reason that the Frankfurt School and Weber have difficulty maintaining due to their dependence on the philosophy of the subject.

Habermas sees self-preservation, which the Dialectic of Enlightenment identified as ultimately lying behind the triumph of instrumental rationality, as underpinned by the logic of communicative action. The notion of self-preservation in the hands of Habermas changes from 'mere' self-maintenance to incorporate the broader concept of social reproduction which he regards as dependent on communicative reason, through which the 'utopian perspective' of emancipation is 'built into the linguistic mechanism of *the reproduction of the species*.' (Habermas, 1987 p.398 - emphasis added) Thus while in his cognitive interest theory the emancipatory interest is 'derived' from the natural history of the human species, with communicative action theory emancipatory reason is located as a quality intrinsic to the evolution of the species as language users. Furthermore, the processes of self-preservation bound by communicative rationality are also dependent on the 'functional interconnection' following from the consequences of the activities of individuals and groups in society. In other words, the social imperatives of self-preservation require mechanisms for both social and functional integration, and these are *constitutive* of the modern subject. [62]

In the shift to communicative action theory, social theory is thus no longer tied to the view of the 'subject that represents objects and toils against them'. (Habermas, 1987 p.390) Instead Habermas uses this shift to locate the instrumental as a moment of a more comprehensive rationality, thereby assigning instrumental action to its 'proper', that is, subordinate place. In doing this Habermas diminishes the importance of social labour, and therefore science and technology, as problems in social theory. For Horkheimer and Adorno these are problematic because they are the most powerful means for the rational domination and suppression of nature. In shifting the focus of his social theory to the norms of communicative interaction between social actors and away from the critique of

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[62] Habermas claims here that 'A subjectivity that is characterised by communicative reason resists the denaturing of the self for the sake of self-preservation. Unlike instrumental reason, communicative reason cannot be subsumed without resistance under a blind self-preservation. It refers neither to a subject that preserves itself in relating to objects via representation and action, nor to a self-maintaining system that demarcates itself from an environment, but to a symbolically structured lifeworld that is constituted in the interpretive accomplishments of its members and only reproduced through communication. Thus communicative reason does not simply encounter ready-made subjects and systems; rather it takes part in structuring what is to be preserved.' (Habermas, 1987 p.398)

instrumental rationality, Habermas does not substantially move away from his earlier view of the need to adopt an objectifying attitude towards external nature.

Indeed, as Hayim suggests, in arguing for the foundational role of communicative reason in structuring society, Habermas does not reduce the importance of instrumental rationality for the economic reproduction of society. Rather he emphasises its 'unproblematic nature ... which appears as a self-maintaining system tied to self-preservation' in which the natural environment is rigidly separated out from the symbolic structure of social life. (Hayim, 1992 p.190) In approaching science and technology as a value-neutral, instrumental activity Habermas continues to stress the practical utility of science in fulfilling the needs of material reproduction (system integration). This has the effect of perpetuating his earlier characterisation of science as part of a human self-formative process, which expresses in a decontextualised, abstract manner *generalised* human interests. As a consequence science is rendered as a 'technically automatic and normatively unproblematic' *species* enterprise. (Hayim, 1992 p.194-5)

Honneth, who is in many aspects sympathetic to Habermas claims that Habermas nonetheless adopts a 'technocracy thesis', in which the notion of communicative action simultaneously fulfils two contradictory functions. On the one hand communicative action is understood as something that stands outside the relations of social labour and domination, and thus provides the basis for a critical social theory. At the same time his theory conceptualises the relations of social labour and domination in a fundamental sense as the product of communicative action. (Honneth, 1991 p.247-8) The technocracy thesis posits the 'irresistible autonomisation of technology' so that the evolution of social rationality occurs largely as a means of providing technical solutions to the problems of social reproduction. Habermas, according to Honneth, accepts science and technology are dominant in advanced industrial society, while at the same time wishing to cast this as a disturbance or pathology of the evolutionary development of the human species. (Honneth, 1991 p.265) This is the theoretical motivation behind Habermas' separation of communicative and technical-purposive action, and which underpins his diagnosis of a one-sided or distorted rationalisation of society. However, in moving away from an emphasis on spheres of social action (labour and symbolic communication) in favour of types of action coordination (system and lifeworld), Habermas' theory of society can be said to rely on Smith (1993 p.197) describes as two key *theoretical fictions* – 'norm-free organisation of action', and 'power-free paths of communication.' [63]

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[63] See also Baxter (1987) p.66-80 and Honneth (1991) p.248-250, 264-266, for discussion of these problems. Habermas' dispute with Foucault on the nature of power revolved around precisely these questions. This is discussed in Chapter 5 of this thesis.

The effect of these moves is apparent in Habermas' treatment of the politics of ecological problems and Green movements. Here his separation of system and lifeworld leads to the argument that ecological movements are not concerned with conflicts arising over the material reproduction of society as are the modernist movements organised around distributive issues (eg the labour and socialist movements). Habermas characterises ecological issues as primarily concerned with 'the grammar of forms of life'. He regards these as problems that arise within the lifeworld ('in areas of cultural reproduction, social integration, and socialisation') provoked by the 'reification of communicative spheres of action' brought about by the intrusion of the functional, system steering media of money and power. (Habermas, 1981c p.33; Habermas, 1987 p.391-396) Habermas suggests that ecological conflicts and environmental movements should be understood as particularistic expressions of resistance to the pressures towards the colonisation of the lifeworld, that is, these movements 'seek to *stem* or block the formal, organised spheres of action in favour of communicative structures'. He identifies the critique of economic growth and the 'self-destructive consequences of the growth in (social) complexity' as key unifying themes in the new social movements. (Habermas, 1987 p.34-5)

While Habermas identifies ecological movements as particularistic reactions to specific, tangible environmental problems, he argues that these specific responses are dependent on the existence of an already highly rationalised lifeworld. Furthermore and somewhat inconsistently, he suggests that ecological problems are 'largely abstract and require technical and economic solutions that must, in turn, be planned globally and implemented by administrative means.' (Habermas, 1987 p.35) Here Habermas also identifies ecological issues as expressions of resistance to the problems generated by the 'overcomplexity' of the system of functional integration. In this context, ecological problems arise as systemic abstractions 'forced upon the lifeworld' which can only be properly dealt with within the already highly rationalised modern lifeworld through communicative action. At the same time however, these systemic 'abstractions' supersede or cut across the complex boundaries between the different modes of action coordination in advanced industrial societies. In Habermas' words, ecological conflicts and problems therefore 'arise at the seam between system and lifeworld'. The implication of this approach is that ecological problems reflect an inevitable tension between communicatively derived cultural norms specifying the acceptable limits to the human appropriation of the natural environment [64] and the functionally defined systemic imperatives of the material reproduction of society.

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[64] Habermas describes these as 'criteria of livability' and 'the limits to the deprivation of sensual-aesthetic background needs'. (Habermas, 1987 p.35)

Conclusion

Habermas' analysis of nature can be read in several ways, and indeed as we have seen, his approach has changed over time. However, central to his analysis is an attempt to separate human from non-human nature. This is not because he adopts a simple realist view of an external 'objective' nature – he clearly does not – but rather because he sees this as necessary if the notion of emancipatory reason (and critique) is to be rescued from an 'Nietzschean' assimilation with power. By making a categorical distinction between communicative and instrumental rationality, Habermas argues that while treating nature as an object of manipulation and control is necessary to human survival and progress, to do the same to human beings themselves is to undermine the goal of such progress - human autonomy.

Central to Habermas' criticisms of Horkheimer and Adorno is the view that power relations between human beings (that is, relations of control and domination) are a pathological outcome resulting from the 'colonisation' and distortion of social relations by technical or instrumental rationality, and not by reason in general. As I shall discuss in Chapter 4, this leads to an idealised view of human subjectivity based on communicative competence and a notion of human emancipation that is premised on power free relations of communication. Habermas is thus forced, by his desire to preserve the ideal of autonomous rational human subject, to rigidly separate the relations between humans from the relations of humans to nature. Such a move is, of course, very much a 'modernist' one.

A consequence of regarding contemporary ecological problems as 'skirmishes' at the interface between system and lifeworld is to cast these as peripheral side effects of the rationalisation of society and the historical progress of emancipation. Given his insistence that nature must be dealt with in an objectifying, instrumental manner, Habermas therefore takes a particularly pessimistic view of the 'emancipatory' potential of ecological politics and new social movements. In contrast to Habermas' approach, other contemporary German social theorists see ecological problems and movements concerned with environmental issues as expressions of the emerging social dynamics of late modernity and as central to political debate. In the next chapter I consider the approach adopted by some of these social theorists to the problem of nature and ecological risk.

Chapter 4

The problem of nature in Eder and Beck

Introduction

In contrast to Habermas, other contemporary German theorists treat the problem of nature as central to social theory. In this respect, these authors can be regarded as reinstating the early Frankfurt School concern with the problem of the relationship between nature and society. This chapter considers in some detail the work of major contemporary social theorists Klaus Eder and Ulrich Beck, and somewhat more briefly that of Niklas Luhmann. All come from the German tradition of social theory in which Habermas has played such an important role. These writers can be regarded as falling within the broad tradition of critical social theory, inasmuch as they argue in their own ways for a critical defence of 'modernity', while at the same time seeking to develop a more relevant critique of the contemporary expression of that modernity. In this context each can be understood as engaging in an implicit critical debate with Habermas [65]specifically on the issue of the way in which his later work does not adequately deal with the challenge posed to modernity by contemporary ecological problems.

(1) Eder: nature as a new field of social conflict

As I have indicated, Habermas tends to see ecological conflicts, and the social movements concerned with these, as reactions to inherent tensions between the communicative production of cultural norms in the lifeworld and the material reproduction of society by the social system. Eder on the other hand seeks to understand such conflicts as both reflecting a new phase in the evolution of modern society, and following Touraine, as an important form of collective action responsible for the historical production of society. [66] Eder sees the problem of

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[65] The debate with Habermas is also quite explicit and direct at times. In commenting on the criticisms of Habermas (by Eder and others) on the question of 'new social movements', Strydom suggests that 'To the extent that they remain within Habermas' framework, they constitute an immanent critique of his position.' See Strydom (1990, p.156-164) and also the comments by Scott Lash and Brian Wynne to this effect in their introduction to Beck (1992b). Luhmann's position is somewhat different, in that he is very much concerned to develop systems theory. Nevertheless, in Theory of Communicative Action, Habermas explicitly seeks to bring together systems theory and hermeneutics, and debates between Habermas and system theorists including Luhmann have occurred.

[66] For an elaboration of Eder's use of Touraine in this regard see Eder (1993) p.107-118. [Originally published as Eder (1982) p.5-20].

nature, and the associated awareness of the worldwide ecological crisis, as the central factor shaping contemporary discourse on modernity. According to Eder, ecological crisis leads to the experience of a 'deep ambivalence' towards the ideas of rationalisation and progress, in which rationalisation is increasingly seen as a socially and environmentally negative process. He argues that notions of progress and rationalisation become increasingly distinct from each other as the problem of nature undermines the modern assumption of the separation of nature and culture. One effect of this is a heightened sensitivity to what Eder regards as a basic ambiguity towards the supposed rationality of modern Western culture, forcing a re-evaluation of the 'normative assumptions of modernity', and a questioning of progress as the inevitable product of modernity. (Eder, 1990a p.67; Eder, 1990b p.40-2) The notion of a negative dialectic of progress, discussed in Chapter 2 of this thesis, is clearly evident here. In particular new types of conflicts arise around the problematisation of the social relation to nature. These call into question the 'old' idea, expressed by the bourgeois and labour movements, of progress through technological development and the mastery of nature. However, unlike Habermas, Eder argues that these new conflicts should be seen as disputes about the type of modernisation and development that modern society should pursue, rather than an expression of a neo-romantic anti-modernism. (Eder, 1990b p.40, 21; Eder, 1993 p.103-112)

The problematisation of nature and progress is related to fundamental changes in social structure brought about by a global process of modernisation and rationalisation involving an intensification of the exploitation of both labour and nature. [67] For Eder, this is not simply the product of capitalist development, but rather, capitalist development is only one element of a much broader social process of modernisation. [68] He sees this process as tied to significant changes in the class structure of advanced Western societies, in which the growth of new middle class groups, associated with the service sector, are becoming a key element of 'the emerging post-industrial society.' (Eder, 1990b p.22, 37-41) [69] The emergence of these post-industrial class conflicts challenges the prevailing model of social development (what Eder calls *industrialism*) common to both

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[67] See Yoxen (1981) p.66-122 for a similar argument in relation to the growth of molecular biology. Yoxen's analysis draws on both Marxist and Foucauldian concepts.

[68] Here Eder shares a view common to both Weber and Horkheimer and Adorno in Dialectic of Enlightenment. Turner suggests that Weber's immediate analysis of the role of Protestantism in the rise of capitalism is complemented by long-term view that understands Western rationality (and the processes of rationalisation) as pre-dating capitalism, that is, as involving a 'long-term teleological and irreversible process in Western culture.' See Turner (1987) p.222-41, especially p.234.

[69] A more detailed treatment is given in Eder (1993). There is a significant literature on the notions of the 'new class' and its relation to post-industrial society. For discussion of this in relation to the rise of environmentalism and Green movements, see Betz (1991) and Eckersley (1989).

capitalist and socialist societies. According to Eder, the main features of this new type of society are social conflicts 'centred around the problem of the exploitation of nature', and the central role played by social and cultural movements in 'determining the direction of further "modernisation".' (Eder, 1990b p.22)

Eder's approach gives rise to a range of criticisms of Habermas' treatment of the problem of nature and his use of the system / lifeworld dichotomy in connection with this. These criticism are important for they suggest how Habermas' tendency to marginalise environmental issues can be overcome without abandoning the insights of a 'macro' or social systems approach to ecological problems. In particular, Eder criticises what he describes as modernism's dominant cultural model of nature, which attempts to ignore the impact of both cultural tradition and external nature on the context of thinking and acting, leading to ethnocentrism and anthropocentricism. (Eder, 1990b p.26-27) Marx's notion of the human relation to nature is firmly within this modernist model, conceiving nature as a mere object of human activity. As a consequence, the Marxist heritage 'naturalises' the social relation to nature, and in doing so posits a notion of rationality involving 'a close relationship between progress and the rationality built into the development of the forces of production.' (Eder, 1990a p.68-9) Eder therefore argues that Marx's productivist notion of rationality defends the cultural model of nature responsible for the environmental crisis now faced by the modern world. Much like Horkheimer and Adorno, Eder sees the progress associated with the subjugation of nature as simultaneously representing a regress in *social* relations with nature. Thus the legacy of Marx and Weber, resting on this particular notion of rationality as inherent in modernity, has become 'equivalent to self-destruction' in that it aggravates this crisis in the relation between society and nature. (Eder, 1990a p.69; Eder, 1990b p.23, 36) Eder also argues that Habermas' critique of Marx is 'insufficient' because Habermas

> substitutes the social relations of men among themselves for the basic relation of man to nature. This solution to the Marxian problem of nature separates two spheres of human action and thus overlooks the internal connections between both spheres of action. The problem of nature forces us to give up the idea that nature is subject to instrumental and culture to communicative action. (Eder, 1990a p.81 footnote 5)

Not only does Eder locate the social relation to nature as central to social theory, as did Horkheimer and Adorno, he also argues that rather than excluding nature from the realm of moral consideration (as does Habermas) it is possible conceive of a practical reason 'compatible with a re-enchanted nature.' Such a alternative form of rationality, says Eder, is in fact found in the new discourses on nature expressed by the ecological counter-culture movements. (Eder, 1990a p.68) Indeed, Eder's analysis of the character, and social function, of ecological movements represents a crucial difference with Habermas.

Habermas' characterisation of new social movements draws a distinction between those that tend to be universalistic and emancipatory (the women's movement and possibly anti-racist civil rights movements), and those that are particularistic and defensive (all others, including the ecology movement). [70] While he distinguishes within the 'resistance movements' between those that seek to defend 'traditional and social property' and those representing a 'new conflict potential' based on 'new forms of cooperation and community', he nevertheless regards all of these as *reactions* to the intrusion into the lifeworld of the forces of money and power originating in the sub-systems of functional integration (the economy and state administration). However, defenders of Habermas claim that, in itself, this need not mean that movements such as the ecology movement cannot contribute to the redressing of what he considers to be the pathologies and distortions of one-sided, 'unbalanced' capitalist modernisation. White for instance, argues that Habermas implies an ideal of 'balanced' development that is consistent with his notion of the unrealised potential of modernity. Seen in this context, says White, Habermas' analysis need not marginalise new social movements and ecological politics as an 'unending border conflict' at the interface of system and lifeworld. (White, 1988 p.136-143) White suggests Habermas' theory in fact positions new social movements 'as the best hope for a more 'balanced' institutionalisation of the potential of modernity'. (White, 1988 p.126-7)

Such an interpretation however has its difficulties. As White concedes, Habermas has not produced any detailed work dealing with the function and significance of such social movements, (White, 1988 p.139) and what he has written tends not to strengthen White's interpretation. [71] Most commentators see Habermas as adopting a pessimistic view regarding the emancipatory potential of new social movements. [72] Indeed Habermas appears to regard any potential rationality as subverted and obscured by the failure of both of 'anti-modern' and post-modern 'conservatism' to distinguish between the different developmental logics of lifeworld and system. (Habermas, 1981c p.36-7)

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[70] Habermas distinguishes the feminist movement from other new social movements on the grounds that the 'struggle against patriarchal oppression' involves the potential realisation of an emancipatory program based in the 'acknowledged universalist foundations of morality and legality (which) lends feminism the impetus of an offensive movement, whereas all other movements are more defensive in character. The movements of resistance and retreat seek to stem or block the formal, organised spheres of action in favour of communicative structures: they do not seek to conquer new territory.' (Habermas, 1981c p.34)

[71] See in particular Habermas (1981c) p.36-7.

[72] See for example Strydom (1990) p.156-164 and Cohen (1985) p.710-11.

Environmental movements as cultural models

Eder's approach to modernity and the role of social movements rejects the distinction that is pre-supposed in Habermas (and Weber), between traditionalism and modernity, and which is expressed in Habermas' view of new social movements as at least potentially and often actually, *anti-modernist*. Instead Eder identifies two competing cultural traditions or models of the relation to nature that contribute to European modernity. (Eder, 1990b p.28-37) These two competing traditions, or contradictory discourses, Eder labels the *justice* perspective and the *purity* perspective.[73] The justice perspective represents the dominant cultural model of nature in Western society, and is expressed in the instrumentalist-utilitarian tradition. The purity perspective embodies a non-utilitarian attitude to nature, which rejects the reduction of nature to an object of theoretical reason. (Eder, 1990b p.31) Eder argues that the 'cultural code' specific to modern Western society *consists of both of these contradictory discourses*, so that modernity, including the social relation to nature, must be understood as the history of the inter-relationship between these two cultural models or discourses. The counter tradition represented by the purity perspective is therefore not so much irrational as the expression of a *different rationality seeking to define an alternative modernity*. This is a significant theoretical move, which is congruent with the actor network critique of modernist epistemology by theorists Bruno Latour and Michel Callon, and which I discuss in Chapter 8 of this thesis.

These two competing notions of nature Eder typifies by a set of conceptual oppositions which contrast different ways of apprehending nature (rationality vs romanticism), of thematising the temporality of the relation of nature to culture (evolution vs equilibrium), and conceptions of practical reason (utilitarian vs

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[73] Eder (1996) provides an explanation of this distinction between the purity and justice perspectives. The notion of purity is derived from the work of Mary Douglas (1966, 1975). In Eder's usage, the purity perspective "codes the difference between nature and culture in a way that is evident in the values attributed to the notion of purity: they are health (referring to bodily and psychic integrity), empathy and life or the complimentary notions of sickness, suffering and death." These types of values are not susceptible to utilitarian calculation, but are "holistic values" and as such are "indivisible goods". In the justice perspective, the instrumentalist tradition seeks to provide a rational legitimation of the social relation to nature. In this perspective, the cultural perception of nature "remains on the level of validity claims". Its mobilises the relation to nature in terms of "the equal treatment of all beings as the premise of human moral action, a premise characteristic of the utilitarian ethics" similar to those of Peter Singer. Eder suggests that this perspective seeks to distribute in a rational way the costs of the use of nature in production, without removing "man from his moral pedestal". It seeks to provide justice through minimising the costs to nature with the effect that the "relation of man to nature becomes one of a private compensation for the economically instituted use of nature." (p.207-8)

communicative reason). (Eder, 1990a p.67) [74] Eder claims that two different but equally modern cultural attitudes or models are expressed in this 'double code'. He argues that the rationalist and romanticist perspectives relate to 'two differentiated spheres of value: the cognitive and the aesthetic.' Thus in the cognitive-rational attitude to nature notions of efficiency are highly valued. In scientific terms nature is something that is capable of being apprehended through the *theoretical reconstruction* of sensory experience. In contrast to this, the aesthetic-romantic attitude is based in a non-objectifying, expressive or intuitive experience of nature, which Eder sees as best typified in modern art. (Eder, 1990a p.74)

The different ways in which the temporal relation between nature and society is conceptualised is another element of the double code of modernity. This relationship can be cast as either a linear, progressive evolution or as a cyclical equilibrium. In the evolutionary perspective nature is understood as an object shaped by societal forces that lead inexorably to the domination of nature, whereas the notion of an equilibrium between society and nature is characteristic of romantic thinking in which nature is held to posses an intrinsic value. However, Eder points out that the notion of equilibrium in this context still 'presupposes an interactive relationship between society and nature'. In other words, inasmuch as the notion of equilibrium presupposes the cultural form that a society bestows on its natural environment, it cannot avoid the 'one-way relationship' characteristic of evolution in society's mastery of nature. Even where the evolution and equilibrium concepts are combined to understand society and nature as evolving together, such co-evolution is still 'a process mediated by culture.' (Eder, 1990a p.74-5) Eder's third 'double code' refers to two competing interpretations or underlying assumptions, regarding morality or practical reason as applied to nature. Utilitarian reason, as the dominant 'economic ideology' of advanced Western society, can be understood as strategic or substantive rationality in the Weberian sense, which is aimed at 'calculating the effects of the use of nature upon nature'. This perspective tends to emphasise human rational self-interest in isolation from 'social and cultural restraints'. In contrast to this, the communicative perspective on practical reason emphasises an interactive, dialogical view of human nature. Attitudes based on this perspective are likely to 'treat nature as a symbolic good and to restrict the uses of nature to what can be justified on moral grounds.' (Eder, 1990a p.75; Eder, 1990b p.34-6)

Habermas tends to focus on those aspects of new social movements that reflect the purity perspective. Eder instead argues that *both* models of nature (each employing different forms of moral reason) are expressed in contemporary

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[74] Eder (1990a) links these two attitudes to nature to differences in the Greek and Jewish cultural traditions - see especially p.70-4. This argument is developed in much greater detail in Eder (1996).

ecological movements and thus there is within such movements a much greater potential for ambivalence than recognised by Habermas. Hence while ecology movements often draw on the romantic, counter-cultural tradition, they also employ the utilitarian perspective with its focus on efficiency. Indeed, as Eder correctly suggests, contemporary ecological thinking can also be considered 'the most advanced version of the dominant utilitarian mind, *a radicalisation of modern economic ideology*.' (Eder, 1990a p.75)[75] Habermas recognises ecological problems as attacks on the 'organic foundations of the life-world' originating at the level of functional integration, while regarding ecological movements as manifestations of resistance to the *effects* of this within the cultural realm of the lifeworld. His view of ecological movements as 'unrealistic' and essentially anti-modern is reinforced by his argument that dealing with environmental problems requires global technical-economic planning and administration. (Habermas, 1981c p.35-7) As discussed previously, although Habermas does not elaborate on these questions. Nevertheless he suggests that while ecological movements are reactions to the 'colonisation' of the lifeworld by system steering media, at root environmental concerns must primarily be dealt with as problems of system integration concerned with the material reproduction of society. Hence he claims that the anti-modernism of new social movements stems from a failure to distinguish between the positive potential of modernity that lies in the rationalisation of the lifeworld and the increasing complexity of the social system. (Habermas, 1981c p.37) This interpretation is consistent with his arguments against the possibility of adopting a genuinely moral-practical (as distinct from aesthetic-expressive) attitude to nature on the grounds that useful knowledge *of nature* must be tied to the objectifying stance of the natural sciences. (Habermas, 1982b p.238-250)

Eder rejects what he sees as Habermas' 'false idealisation' of the separation between lifeworld and system. While recognising the validity of Habermas' concern for relating the 'two logics of social life' (ie lifeworld and system), he argues that practical reasoning can never be separated from the context of social systemic factors (power and money) which it serves to reproduce. (Eder, 1988 p.937-940) However, Habermas' analytical separation of system and lifeworld, with its surrender of nature to the systemic realm of functional reason, underestimates the interpenetration of morality and technology in shaping

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[75] Eder notes here that the 'utilitarian justification of the relationship between man and nature, (is) an idea that links Bentham to modern environmental economists and has spread - paradoxically - with our greater awareness of the environmental crisis.' This is an issue I will touch on in Chapter 6 of this thesis, where I discuss Foucault's notion of biopolitics and the emergence of contemporary discourses and practices which problematise the environment in terms of bio-economic models of ecology. Here it is worth noting that several environmental historians have also pointed to the connection between utilitarian concepts and ideas of nature. See for instance Bramwell (1989) and Worster (1987a).

society.[76] What is more, it obscures the fact that Western culture is the product of the interaction of competing models of practical reason, of the two 'indissolubly tied' notions of progress and modernity. (Eder, 1990a p.76)

The ecological crisis thus brings into question the core assumptions of the received view of modernity, particularly the idea of progress through technological development and the exploitation of nature. Overcoming the separation of nature and culture has become an urgent problem for modern society because the ecological crisis now threatens the material reproduction of society. Eder argues that theorising on modernisation has traditionally focused on the political and economic reproduction of society, but now the focus has shifted to include problems of *ecological reproduction*. Thus Eder argues the problem of nature is not primarily a technical problem of functionally integrating the material needs of modern social system with its natural environment. It is a cultural problem in that it questions the moral dimension of the notion of progress, which has begun to threaten the conditions of life in general. (Eder, 1990b p.40-2) Eder argues that the relation between society and nature is symbolically mediated, and that this requires us to

> reconstruct the theoretical idea of forces of production as a cultural category, as a specifically defined cultural form for appropriating nature ... we can extend our notion of a social relation to nature and see the basic forms of social life from production to consumption as being determined by specific cultural definitions of that relation to nature. (Eder, 1990a p.69)

This approach accomplishes what Habermas' approach to new social movements has difficulty in doing. Problems of material reproduction at the system level can now be linked with the actions of ecological movements in a way that understands this as more than the 'overlap' of communicatively derived cultural norms and the functionally defined imperatives of the system maintenance. Eder's approach thus allows a more sophisticated understanding of the ways in which discourse on ecological problems contributes to the historical production of contemporary society.

Habermas draws an overly restrictive and simple contrast between emancipatory social movements (bourgeois, labour and socialist etc) concerned with material reproduction and problems of distribution, and new social movements concerned with the 'revitalisation' of the possibilities for expression and communication within the lifeworld. Eder on the other hand sees nature as a field of collective action within which ecological movements engage in defining

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[76] This is a theme discussed in my examination of the work of theorists such as Nikolas Rose and Bruno Latour in later chapters.

the future direction of social development and modernisation. This changes the logic of social conflict by mobilising the way in which nature is symbolised as a 'new cultural model' for organising social action. (Eder, 1990b p.36-8) Thus according to Eder it is necessary to distinguish within contemporary environmentalism between *social* and *cultural movements*.[77] Social movements in this approach are understood as the carriers of notions of social progress. Within the ecological movements this is expressed in the concern to establish a more *rational* social relationship to the natural environment. This concern is essentially a utilitarian one that carries forward, in a new form, the notion of the material rationality characteristic of the 'old' social movements. It seeks to 'optimise the relation to nature, to establish a cybernetic state of nature in society.' (Eder, 1990b p.39) [78]

Environmentalism as a social movement in Eder's sense then, is concerned with what Weale (1992) calls a new politics of *ecological modernisation*, that is, with a more rational and efficient management of the natural and social environment. [79] According to Weale, the ideology of ecological modernisation is characterised by the reconceptualisation of the relationship between economy and environment. In particular, it is argued that avoiding the costs of environmental protection in the present does not eliminate these costs, but merely transfers these to future generations. Further, it is argued that environmental protection should not be seen as an economic burden but a source of future economic value both in terms of its capacity to contribute to economic growth in an increasingly technological society and as a source of comparative advantage in a global market. (Weale, 1992 p.75-9)

Cultural movements do not share this vision of rationalising the management of nature. Rather these seek to establish a social relation with nature based on a moral-practical rationality that questions 'not only the social relations of production, domination and consumption, but also the symbolic forms serving as the medium of these social relations.' (Eder, 1990a p.74; see also Eder, 1990b p.39) It is in this sense that Eder talks of the counter-cultural aspects of the ecology movements. Such cultural movements have accompanied social movements throughout the course of societal modernisation, and as such they are 'inextricably tied' to contemporary ecological movements, although always in potential opposition to the social movements. The ambivalent character of

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[77] It is perhaps necessary to say that elements of both can co-exist within ecological movements.

[78] See also Eder (1990a, p.74; 1993, p.115-8). This is discussed further in Chapter 6 of the current thesis. Worster (1987a) provides a comprehensive historical account of the utilitarian or bio-economic aspects of modern ecological thought.

[79] It is easy to see the appeal to utilitarian values in this. The appeal to notions of inter-generational equity is a clear example of Eder's justice perspective. I discuss the notion of ecological modernisation further in Rutherford (1999a). See also Christoff (1996).

contemporary environmentalism is therefore a product of the tension between these two types of movements. Such a distinction is very important for understanding the contradictory character within environmentalism between modernising, science-driven discourses and romantic, re-enchanting discourses. These rival discourses co-exist and co-influence the political and cultural idioms within which social relations with nature as thematised and expressed. [80]

(2) Beck: ecological risk & reflexive modernisation

Whereas Eder is critical of Habermas' 'false idealisation' of a 'pure systemic world in social life' separate from the cultural processes of the lifeworld, (Eder, 1988 p.938) the approach taken by Ulrich Beck sees ecological crisis as the structurally determined, systemic product of the modernisation process. For Beck this process is one in which, by the late twentieth century, the expansion of science and technology has produced a range of historically unprecedented global, life threatening hazards and risks. Habermas argues that the 'uncoupling' of the functional requirements of system integration, which are directed to the material reproduction of society, from role of the cultural lifeworld in social integration, is both the result of the increasing complexity and rationalisation of modern society. He also this as *necessary* for the coordination of different types of social action within such society. (Habermas, 1987 p.153-5, 183-5) Beck, however, claims that this sort of differentiation reaches a point where the 'latent side effects' it produces start to break-down the bases of both the material reproduction of society and the separation of the social 'subsystems of economy, politics, culture' etc from nature. (Beck, 1992b p.81) As is Eder, Beck too is critical of the tradition in Western thought that sees an antithesis between nature and society, arguing that nature is utilised and 'circulates' within the social system including its cultural 'sub-systems'. (Beck, 1992b p.80-2)

Beck nevertheless can be said to argue from *within* the broad perspectives of a critical social theory concerned with modernisation and processes of societal

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[80] Melucci (1989) suggests a similar contrast between 'technocracy' and 'naturalism'. However he goes on to argue that 'in highly developed societies the systems of control are being restructured to integrate the alleged 'naturalness' of needs in support of new models of conformity promoted, for example, by advertising campaigns based on the mythology of a 'pure' body and a 'natural' and 'healthy' environment. This trend can be resisted only by keeping open the tension between 'natural' needs and the constraints of social existence. That in turn requires the recognition that the 'nature' ... within us ... which expresses itself as a site of deeply felt needs ... is in reality inseparable from the rules and rituals of social life.' (p.121). However, it should be noted that while in one sense the romantic or naturalist counter-cultural movements embrace an expressive, intuitive attitude to nature, these intuitive norms, as Melucci (and Habermas) implies, are derived from the symbolic resources of social life (the lifeworld) and in contemporary Western society this includes science as a powerful source of 'cosmology'. This point is recognised by recent works written from an ecocentric perspective - see in particular Mathews (1991, p.48-50); Fox (1990, p.252-3); Eckersley (1992 p.114-6).

rationalisation. However, unlike Habermas, he is more inclined to see the 'dark dimension' of these processes, and in particular the role performed by science and knowledge in producing the negative and self-destructive side of progress. He does however share with Habermas a view of modernity as a collective learning process possessing an emancipatory potential realisable through the expansion of the public sphere. As Scott Lash and Brian Wynne suggest in their introduction to Beck's Risk Society, the theory of *reflexive modernisation* developed by Beck can be viewed as an immanent critique of Habermas. It seeks to take into account the centrality of ecological problems for contemporary social theory, and does so in a way that 'can potentially provide the foundation for the rejection and recasting of Habermas' notion of modernisation as (an) Enlightenment project.' Both Beck and Eder thus share an appreciation of the existence of a negative dialectic of progress, which has more in common with Horkheimer and Adorno than with Habermas.

As with Eder, Beck understands the processes of global modernisation as producing a new type of society, based on quite different social conflicts to those of the earlier period of 'primary industrialisation' – that is, up to the 1970s. (Beck, 1992b p.20, 22) In common with Eder, it is this new *ecological field of conflict* that Beck sees as fundamental to the analysis of contemporary society. This new phase of modernity is seen by Beck in terms of a systemically induced shift from problems of wealth distribution to those of risk distribution. According to this analysis, classical industrial society is primarily organised around addressing problems of material scarcity. Industrial society, through technological productivity and the establishment of welfare state mechanisms, has to a significant degree provided the capacity to meet real material needs. [81]

However, the development of the same productive capacity that enables this, at the very time gives rise to a whole new category of unintended and unforeseen risks and hazards. According to Beck, in late modernity industrial societies are less concerned with how to overcome scarcity than with how to limit and distribute the effects of these systematically produced 'latent side effects'. This means that Weber's notion of rationalisation, as strategic or purposive rationality, no longer adequately characterises the current phase of the modernisation process, for along with the expanding productive capacity of science and technology has come the 'incalculability of their consequences.' Thus the unintended, destructive consequences of technological development become 'a dominant force in history and society', to the extent that the benefits of science and technology in utilising the resources of nature begin to be overshadowed by the costs of political and

[81] Note that Beck specifically identifies this as the situation in the advanced industrial states of the West. The logic of wealth production and distribution, ie meeting 'obvious material need', remains central to societal modernisation in the less industrialised countries of the 'Third World'. See Beck (1992b) p.20.

economic management of the risks generated by technology. (Beck, 1992b p.19-22)

The potential for 'self-endangerment', rather than self-preservation, is therefore a fundamental feature of this new phase of modern society which Beck calls *risk society*. In late modernity ecological and technological risks are of a completely different character to natural disasters or the risks and hazards of wealth production in the era of primary industrialisation. These new ecological 'mega-risks' [82]

> induce systematic and often *irreversible* harm, generally remain *invisible*, are based on *causal interpretations*, and thus initially only exist in terms of the (scientific or anti-scientific) *knowledge* about them. They can thus be changed, magnified, dramatised or minimised within knowledge, and to that extent they are particularly *open to social definition and construction*. Hence the mass media and the scientific and legal professions in charge of defining risk become key social and political positions. (Beck, 1992b p.22-3 – original emphasis)

Habermas claims that ecological problems are system-generated abstractions 'forced upon the life-world', which require system-based scientific, administrative and economic solutions. Despite this, protest and resistance to environmental problems is often a *localised* response to the 'tangible destruction' of the environment, to the everyday experience of 'developments that visibly attack the organic foundations of the life-world' such as poor urban planning, destruction of the countryside and the health affects of pollution. (Habermas, 1981c p.35-6) The problem with this is that Habermas fails to explain how these 'abstract', generalised system-level problems are connected to the everyday perception of 'specific' problems in the lifeworld. His earlier treatment of nature in terms of cognitive interest theory in fact would appear to offer some help in this regard. It will be recalled that there Habermas characterised external (or objectified) nature as consisting of 'possible objects of experience' which share both a certain independence and externality, and the 'produced objectivity' of a 'world-

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[82] The risks Beck refers to are 'above all radioactivity, which completely evades human perceptive abilities, but also toxins and pollutants in the air, the water and foodstuffs, together with their accompanying short- and long-term effects on plants animals and people.' (Beck, 1992b p.22) Elsewhere these are defined as including nuclear power, (and) many types of chemical and bio-technological production as well as the continuing and threatening ecological destruction.' These are described as 'nuclear, chemical, genetic and ecological mega hazards.' (Beck, 1992a p.101-2). I generalise these various manifestations of technological risk as *ecological risks*. Such a generalisation while useful for the sake of brevity, is also consistent with Beck's own inclinations. This is attested to by his use terms such as 'ecological enlightenment' and 'ecological democracy' in his calls for the strengthening of the public sphere and the creation of a 'public science', which he sees as a necessary political corrective to the potentially self-destructive production of 'mega-risks'. See Beck (1992a) p.118-9.

constituting' social practice, or '*Lebenspraxis*'. (Habermas, 1978 p.25-42) [83] However, in moving away from his earlier notion of universalised species-interests and towards a concern for systems of action co-ordination, Habermas also neglects any further elaboration of the thesis of a *strong mediation* between 'nature' and social production of scientific-technical knowledge contained in his earlier work.

Scientific expertise and the production of risks

Beck places the mediation between nature and science at the centre of his theory of modernisation. He demonstrates that what constitutes a risk, and the way in which the consequent hazards are distributed, are discursively defined. The sorts of global ecological hazards Beck is concerned with, such as depletion of the stratospheric ozone layer and radiation contamination, are generally not visible or perceptible in any unmediated way to the every-day experience of the lifeworld. These sorts of ecological risks and hazards only come into existence through the objectifying medium of expert judgement. They are not things of simple experience but in a very strong sense 'require the 'sensory organs' of science - *theories, experiments, measuring instruments - in order to become visible or interpretable as hazards at all*.' (Beck, 1992b p.27) Unlike the problems of earlier industrial society which involved material scarcity, those of late modernity cannot be overcome by further development of the means of production and redistributive social welfare. Previously exposure to risk was primarily determined by class, whereas in late modernity risk is 'somehow universal and unspecific' and no longer produces the sort of social solidarities associated with class positions. 'Risk positions', argues Beck, are constitutive of new dependencies in which the victims of technologically produced hazards are rendered '*incompetent* in matters of their own affliction' as increasingly the power of judgement and definition is reserved by expert, 'external knowledge producers'. Thus on Beck's analysis, both the substantive and theoretical production of risks are structurally linked through the *knowledge dependent* dynamic of modernisation, in which material conditions of life and the production of knowledge are fastened tightly together.

Beck characterises risk society as involving the loss of '*cognitive sovereignty*' by the individual when it comes to ecological hazards. Thus unlike 'losses in income and the like', exposure to ecological threats involves 'loss of sovereignty over assessing the dangers, to which one is directly subjected. The whole bureaucracy of knowledge opens up, with its long corridors, waiting benches, responsible, semi-responsible, and incomprehensible shoulder-shruggers and

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[83] See also my discussion of this in the section 'Nature and cognitive interests' in Chapter 3 of this thesis.

poseurs ... (that regulate) ... how one gets access to knowledge, (and) how it should be done'. (Beck, 1992b p.53-5) This view, while undoubtedly pointing to the way in which technocratic expertise is not politically accountable to citizens, also suggests that the lack of such *cognitive sovereignty* and political accountability seriously undermines the democratic role of the citizen in risk society. I turn to a detailed consideration of the issue of sovereignty and related issues in Chapters 7 to 9.

For Beck the production of risk is not simply a question of the factual-methodological substance of knowledge; rather defining hazards involves both scientific-theoretical elements and moral-practical ones. [84] The moral component arises from the statistical character of risk assessments. Risk determinations combine mathematical probabilities of hazard with calculations of social interests. Decisions dealing with risks thus not only deal with statements of probability but are '*at the same time* also decisions defining *who is afflicted*, the extent and type of hazard, the elements of the threat, the population concerned, delayed effects, measures to be taken, those responsible, and claims for compensation.' (Beck, 1992b p.54) The moral dimensions of risk determination are generally hidden by a technocratic dynamic that reduces risks to questions of scientific and technical manageability. Nevertheless, suggests Beck, risk society exaggerates the gap between *scientific* and *social* rationality, while at the same time bringing into focus the dependence between the two.[85]

While arguing that the social role of science and technology is central to the development of risk society, Beck is highly critical of the way in which critics of technocracy and ecological problems themselves tend to argue from a scientistic position. He is thus critical of calls for a new ethical approach to science precisely because this ignores the influence of the 'logic of technocracy', that is, the 'autonomisation of technological development and its interconnections with economic interests.' (Beck, 1992a p.106) [86] Science is fundamental to the production of technological risks while at the same time scientific expertise is

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[84] Beck claims that the experience of risks 'presume a normative horizon of lost security ... Behind all the objectifications, ... the question of acceptance arises and with it anew the old question: how do we wish to live?' That is, the issue is not simply the definition of the probability of hazard, but also definition of degrees of acceptability and the social distribution of risk. See Beck (1992b) p.27-30.

[85] 'The scientific concern with risks of industrial development in fact relies on social expectations and value judgement, just as the social discussion and perception of risks depends on scientific arguments. Risk research follows ... in the footsteps of 'technophobia' which it was called up to restrain, and from which, moreover, it has received an undreamed-of material support in recent years.' Beck (1992b) p.30.

[86] Calls for an 'ethical renewal of the sciences', and towards nature in general, are common to much Green political thinking. For a discussion of this see Eckersley (1992), especially Chapter 5.

given 'binding authority' ahead of law and politics, to define risks and specify how they are to be managed. Thus while there is a monopolisation by scientists and engineers in diagnosing hazards, the authority of science is constantly undermined and called into question by its failure to contain or control these ecological hazards.[87] In fact Beck's thesis is stronger than this, arguing that the development of theoretical knowledge in the sciences *systematically* multiplies analyses of risks while undermining the 'original claims' that scientific management of risk is capable of providing physical security from hazard. (Beck, 1992a p.106-7)

At the same time Beck warns that the debate about ecological risk is largely conducted in natural scientific terms, in which the problems are seen to be chemical, biological, technological etc in origin. The debate thus tends to present human beings 'only as *organic material*', turning into a 'discussion of nature *without* people'. His argument is that the critique of industry and technology remains fundamentally locked into a naturalistic and technocratic perspective characterised by a 'loss of social thinking'. This perspective, Beck suggests, is held by the *political* environment movements (in contrast to alternative life-style movements) as well as by governments.[88] It is a perspective that renders modern society in terms of the technical domination of nature while obscuring 'the social,

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[87] See Yearley (1992) for a discussion of the way in which this creates particular problems for environmental movements when they seek to use science to legitimate their political objectives.

[88] Beck's reference to the 'political' environment movement suggests the distinction made by Eder between the social utilitarian elements of the ecology movement (ie those based on the *justice* perspective), and the cultural, 'alternative lifestyle' element based on the *purity* perspective. However, even these cultural movements, such as 'deep ecology' emphasise ethical concern for the intrinsic moral value of non-human life, but this is still very much based on a scientific ontology which is taken as the source of its 'ecocentrism' (non-anthropocentricism), that is, such cultural movements employ cultural values derived from a highly scientised lifeworld. The appeal to science as the source of moral and epistemic authority is evident in the recent works of ecocentric theorists such as Eckersley, Fox and Mathews. Ecocentric theory is critical of what it sees as the instrumental, objectifying attitude toward nature adopted by the technocratic dominant political culture, linking this to an anthropocentric worldview. However these writers attempt to overcome this not by rejecting science per se, but by calling for a 'new science' that is guided by an ecocentric interest in maintaining the integrity and health of the ecological system. (Eckersley, 1992 p.114-6) Fox makes a distinction between the instrumental and cosmological functions of science, suggesting that modern science provides a cosmology that 'has had profound non-anthropological implications', enabling green theory to understand 'our place in the larger scheme of things'. (Fox, 1990 p.252-3) Mathews, following Naess, argues for a Spinozan monism as the basis for her theory of the 'ecological self' in which science, stripped of 'mechanistic assumptions, is a superlative tool for investigating the nature of the physical world.' While science cannot be taken as the sole basis of knowledge and truth, it nevertheless is indispensable to a new ecological worldview. Thus Mathews argues that in Western cultures environmentalism cannot posses legitimacy and credibility without 'the sanction of science'. (Mathews, 1991 p.48-50).

cultural and political risks of modernisation'. [89] In this respect Beck's work can be said to share with the Frankfurt School, Eder, and to a degree Habermas (particularly his earlier work), an understanding of nature as *historicised*. An important consequence of this view of nature as conditioned and symbolically mediated by social practices, is the critique of the fetishising of both 'progress' and 'nature',[90] and of the political function of scientific knowledge.

In light of advanced industrial society's systematic production of ecological 'mega-hazards' which threaten the natural foundations of life, Beck argues that the reappraisal of the relationship between society and nature has become a key task for social theory. In particular he claims that it is no longer possible to cling to the nineteenth century notion of an antithesis between nature and society, which understands nature and society as *outside of* each other. (Beck, 1992b p.80) At the end of the twentieth century nature must be understood as an historical product, thoroughly integrated into and affected by the global system of industrial production. Such a 'societalisation' of nature also means the '*societalisation of the destruction and threats to nature*'. Under Beck's approach, environmental problems serve as the 'conceptual arrangement' in which the damage done to nature through its social appropriation is re-employed as a resource in new types of social and political conflict. [91] The consequence of this is that 'in advanced modernity, society with all its subsystems of the economy, politics, culture and the family can no longer be understood as autonomous of nature.' (Beck, 1992b p.81) At the same time, Beck rejects the naive realism and scientism so evident in much of the debate about protecting the natural environment. He is direct in his characterisation of nature as a 'highly synthetic product', in that nowhere today is 'nature' untouched by human intervention. Similarly, science does not deal with nature in a purely 'objective' manner, but within institutional contexts serving a 'generalised social claim to the mastery of nature.' According to Beck therefore,

> what is treated there as 'nature' is the internal 'second nature' brought into the cultural process, and thus burdened and overburdened with not

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[89] Beck comments that: 'it is as if there had never been people such as a certain Max Weber, who apparently wasted his time showing that without including structures of social power and distribution, bureaucracies, prevailing norms and rationalities, such a debate is either meaningless or absurd, and probably both.' He further pointedly comments, '... this absence seems to strike no one, not even sociologists themselves.' (Beck, 1992b p.24-5)

[90] See Buck-Morss (1977) p.49-56 and Chapter 2 of this thesis for discussion of this aspect of Horkheimer and Adorno's work.

[91] Thus Beck states 'That means that 'modernisation risks' are the conceptual arrangement, the categorical setting, in which injuries to and destruction of nature, as immanent in civilisation, are seized upon socially. In this scenario of conflict, decisions are made as to the validity and urgency of risks, and the way they will be repressed or dealt with is decided. Modernisation risks are the scientised 'second morality' in which negotiations are conducted on the injuries of the industrially exhausted ex-nature in a socially 'legitimate' way.' (Beck, 1992b p.81)

> very 'natural' system functions and meanings. ... In other words, because it is a nature circulating and utilised within the system, nature has become political, even at the objective hands of objective scientists. (Beck, 1992b p.81-2)

Beck's analysis of the relationship between nature and society with its emphasis on the system and its sub-systems of action coordination, is clearly influenced by the Habermasian framework. Similarly, Beck's treatment of nature has much in common with Habermas' earlier view of objective nature, in which nature is seen as that which is constituted as an object of human instrumental action and the scientific knowledge that serves this. (Habermas, 1978) [92] In particular, Beck's analysis points to the systematic production of risks in late modernity as originating in a narrowly economic, 'techno-scientific rationality' which he explicitly identifies in Habermasian terms as 'a type of *productivity-raising knowledge interest*.'[93] Yet Beck's work also enriches Habermas' analysis. by demonstrating the ways in which ecological problems, arising from what appears in Habermas as the largely technical problems of the material reproduction of society, interconnect with economic and political subsystems as well as the cultural subsystems Habermas designates as belonging to the lifeworld.

Much criticism of Habermas relates to the perceived rigidity or abstractness of his notions of system and lifeworld, and the distinction between his different categories of rationality. [94] Beck argues that nature cannot be considered autonomous from society *and* its subsystems (economy, politics, culture and the family). Also, as has been indicated above, 'nature' for Beck is *societalised nature*, which is reproduced and utilised within the social system. In this regard, Beck can be interpreted as joining the criticism of Habermas' overly rigid, or in Eder's words, 'false idealisation', of the separation of system from lifeworld. In any case, it is clear that Beck wants to show the multiple interconnections between system and lifeworld, [95] and that in doing this he is far more critical of

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[92] See my discussion in that section of Chapter 2 of the current thesis headed 'Nature and cognitive interests'.

[93] 'This once again clarifies how a type of productivity-raising knowledge interest (to put it in Habermas' terms) prevails historically in scientifically directed technological development, an interest which is related to the logic of wealth production and remains embedded in it.' (Beck, 1992b p.60-1)

[94] See for example Giddens (1982) p.82-116; Baxter (1987) p.39-86; Eder (1988) p.931-944; Hayim (1992) p.187-209; Eckersley (1992) p.97-117; Ottmann (1982) p.79-97; Whitebook (1979) p.41-69; Strydom (1990) p.156-164; Alford (1985b) p.139-177.

[95] While it is beyond the scope of the present work to give a detailed account of all aspects of the relationship of Beck's theory of reflexive modernisation and Habermas' work, it should be noted that Beck's work is concerned to explicate the 'distributional logic of modernisation risks' and the impact this has on the various aspects of social structure in advanced industrial

the sciences than is Habermas. For example, Beck argues that the origin of the critique of modern science and technology 'lies not in the 'irrationality' of the critics, but in the *failure* of techno-scientific rationality in the face of growing risks and threats from civilisation.' (Beck, 1992b p.59) Such a comment can be interpreted as an implicit criticism of Habermas' approach to the ecological movements.

In his limited treatment of environmental problems, Habermas' inclination is to characterise ecological movements as part of a wider 'neo-conservatism' that rejects modernity's 'reasonable content and its possibilities for the future'. (Habermas, 1981b p.13-4; Habermas, 1981c p.33-7; Habermas, 1982b p.245-50) I have suggested that the basis for this stand can be found in Habermas' claim that in modernity the differentiation of value spheres requires the application of instrumental rather than practical reason to human relations with nature.[96] He conceptualises system and lifeworld as distinct domains of action coordination in which ecological problems are primarily matters of material reproduction.[97] In contrast to this view of ecological movements as essentially anti-modern, Beck understands them as the result of a growing awareness of the risks produced by the latest phase of modernity. This awareness Beck attributes both to the increasing *scientisation* of risk, and the expanding *commerce* in risks. (Beck, 1992b p.56) The scientisation of risk undermines a strict separation of system from lifeworld inasmuch as risk is experienced in an already highly scientised lifeworld, that is, the perception of modern ecological hazards depends on 'a *theoretical* and hence a *scientised* consciousness, even in the everyday

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society, that is, its impact on social class, work, gender, individual biography, etc. In doing this Beck 'fleshes out' the connection between 'lifeworld and system' in a way that Habermas only does at a far more abstract level. Thus Beck comments, 'Everything which appears separated in the perspective of systems theory, becomes an integral component of the individual biography: family and wage labour, education and employment, administration and the transportation system, consumption, pedagogy, and so on. Subsystem boundaries apply to subsystems, not to people in institutionally dependent individual situations. Or, expressing it in Habermasian terms, individual situations lie across the distinction between system and lifeworld. The subsystem boundaries pass through individual situations which are, so to speak, the biographical side of that which is separated by system boundaries. Considered in this way, we are concerned with the individualised institutional situations, whose connections and fractures (neglected on the level of the system) continually produce frictions, disharmonies and contradictions within and among individual biographies.' (Beck, 1992b p.136-7)

[96] Habermas claims that there is a 'basic philosophical question' of how a non-objectivising attitude to nature could be 'adequately grounded today without recourse to the substantial reason of religious or metaphysical world-views, how it could be grounded at the level of learning attained in the modern understanding of the world.' (Habermas, 1982b p.248)

[97] Habermas distinguishes problems of material reproduction from the ecological movement's 'new politics' concern with the 'grammar of forms of life', that is, the question of 'how to defend or reinstate endangered life styles, or how to put reformed life styles into practice.' (Habermas, 1981c p.33).

consciousness of risks.' (Beck, 1992b p.28) Because Beck sees the substantive production of risks as closely tied to the development of expert scientific knowledge, he is able to focus on the link between risk production and its 'cognitive agents'. These cognitive agents comprise not only the those experts who produce scientific knowledge and its technological applications, but also those 'counter-experts' of the ecological movements etc, responsible for producing critiques of environmental degradation and technology.

Advanced industrial society thus displays a 'system immanent' capacity to endanger the ecological conditions of its own existence while at the same time producing a self-referential, or reflexive, 'questioning of itself through the multiplication and the economic exploitation of hazards.' (Beck, 1992b p.56-7) In this perspective, ecological movements can be seen not so much as opposed to modernity as an important force for *ecological modernisation*.[98] In Beck's view, the influence of such movements derives in large measure from the existence of systemic contradictions arising from the industrial production and political administration of risks, which become an object of public concern through the 'needling activities' of ecology and citizens groups. In this way, according to Beck, the counter experts of the ecological movements, in conjunction with mass media, have taken the thematic initiative and placed the question of 'the threat to life' on the social agenda. (Beck, 1992a p.115-6) [99]

What is particularly interesting in Beck's analysis is the way in which it connects the concerns of ecological movements, primarily understood by Habermas as the cultural expression of alternative 'lifestyles', with the broader issues of global political economy, and the relationship between scientific knowledge and power, in risk society. In so doing Beck provides a more substantive consideration than does Habermas of the way in which what I have referred to as the *problem of nature* gives rise to systemic (or functional) pressures for *ecological* modernisation. [100] While this line of argument is not logically incompatible with Habermas' systems approach, it is unnecessarily marginalised by his tendency to see ecological politics as largely isolated to cultural-aesthetic questions. This a view, which as I have argued, is clearly the

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[98] This is not a term used by Beck, although he does talk of 'ecological enlightenment'. See Beck, (1995a). Beck speaks of 'reflexive modernisation'.

[99] The role of the media is important in Beck's argument: 'the evening news ultimately exceeds even the fantasies of countercultural dissent; daily newspaper reading becomes an exercise in technology critique.' (p.116) Beck stresses the dependence of such critique on the existence of certain social conditions which prevail 'in only a few countries' (ie the West) such as parliamentary democracy, material affluence and an independent press, ie it is a product of liberal democracy.

[100] Eder makes a similar point in his discussion of ecological thinking as 'a radicalisation of modern economic ideology.' See Eder (1990a) p.75.

result of his attempts to isolate the critique of instrumental reason so as to save an emancipatory role for reason.

As I have indicated earlier in this section, Beck argues that ecological risks are characteristic of a new phase of modernisation which brings into being quite different forms of social differentiation and conflict to those of the earlier period of primary industrialisation. The conflicts that arise in relation to the ecological risks of modernisation, while not in themselves conflicts of wealth distribution, nevertheless are closely connected to the economic subsystem and to problems of material reproduction. The emergence of ecological risks and conflicts challenge key notions of industrial society such as 'progress', 'scientific rationality' and 'economic growth'. Beck suggests therefore, as does Eder, that ecological conflicts 'take on the character of *doctrinal struggles* within *civilisation* over the proper road for modernity'. (Beck, 1992b p.40) This is contrary to Habermas' view of these movements as conservative and anti-modern *per se*. [101] Hence debates that question industrial society's exploitation of nature raise more than the moral worth of nature, they also question the monopoly of autonomised and concealed social change exercised by science and technology under the rhetoric of progress.

This new ecological field of conflict creates new configurations of power relations in the global economy in which, at least for the advanced industrial nations, the elimination of scarcity increasingly tends to be replaced by the elimination of risk as the rationale of the social system. There is thus a major difference between the sorts of social antagonisms generated by wealth production and those created by hazard production. The older antagonisms between labour and capital, created by problems of scarcity and wealth distribution, are undermined by the material success of industrialism. At the same time the systemic technological production of hazards creates new antagonisms, in which the 'destruction of nature and *destruction of markets* coincide':

> 'Threats to nature' are not only that; pointing them out also threatens property, capital, jobs, trade union power, the economic foundation of whole sectors and regions, and the structure of nation states and global markets. ... (W)ealth production produced antagonisms between capital and labour, while the systematic chemical, nuclear and genetic threats bring about polarisation between capital and capital - and thus between labour and labour - cutting across the social order. (Beck, 1992a p.110-11) [102]

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[101] See also Eder, (1990b) p.40, 21 and (1993) p.103-112.

[102] Beck notes here that one of the consequences of this is that labour and labour power are no longer simply understood as sources of wealth production but also as social forces of 'threat and destruction'. (p.113) This is reflected in the general critique of industrialism apparent in

The distribution and effect of risk does not fall equally. Some sectors of the global economy and some regions suffer more than others from the destruction of nature. Thus toxic accidents and pollution can transform particular commercial interests into economic wastelands. [103] Events such as the Chernobyl nuclear reactor accident and the Exxon Valdez oil spill are clear examples of such ecological catastrophes, but more insidious processes, such as loss of fishing grounds through ocean pollution or loss of agricultural and silvicultural productivity through acid rain etc are also significant. Ecologically damaged regions come into existence which transverse the borders of nation states and the established 'lines of conflict' within societies. Global ecological problems, especially those such as greenhouse gas induced climate change, have the potential to undermine the economic basis of entire regions and states, leading to waves of 'eco-refugees and climatic asylum-seekers'. While global hazards cut across traditional social class positions, they nevertheless still impact most on the poorest within these newly defined ecological zones of conflict. (Beck, 1992a p.110-11) At the same time however, technologically induced risks may also represent market opportunities, both in terms of such things as pollution control technology and expanded demand for professional expertise in the areas of ecological management and environmental assessment and administration. [104]

Beck argues that the new social antagonisms of risk society are expressed in a complex set of 'tensions between business and the elimination of risks, and between the consumption and the production of risk definitions' giving rise to '*definitional struggles over the scale, degree and urgency of risks*.' (Beck, 1992b p.46) On one level hazards are the creation of what appears as an autonomous process resulting from a strictly instrumental use of technology in the production of commodities. However, these hazards are defined and evaluated not at the level of the private firm, but socially through a matrix of 'quasi-governmental power

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much Green social analysis. For example see Bahro (1986) p.12-13, 45-8 and Porritt (1894) p.77-82.

[103] Beck suggests that with such catastrophes ' ... 'blank spots' on the map arise again in the most advanced stage of civilisation. ... suddenly discovered toxic waste dumps, transform housing estates into toxic waste estates and turn farmland into wasteland.' (Beck, 1992b p.39)

[104] The direct cost of complying with the United States' pollution control regulations alone has beenestimated to be in excess of US$100 billion per year. (Jasanoff, 1992 p.195) While this is a cost to some sectors of the economy, the supply of equipment and expertise by other sectors represents significant new market opportunities. For example, the US market for the commercial treatment, storage and disposal of hazardous waste was valued at $3,000 million in 1997; in the same year environmental remediation and associated consulting cost $8,000 million. (HazNews, 1998 p.1) The European Commission explicitly recognises this: 'the future competitiveness of Community industry on world markets will depend heavily upon its ability to offer goods and services causing no pollution and achieving standards at least as high as its competitors. ... Technological innovation allied with a commitment to high supply standards can open up new opportunities, by developing new markets and putting to work the technologies of the future.' (Commission of the European Communities, 1986 p.3)

positions' encompassing the debate among scientific experts, in juridical interpretation, and in the mass media. The transformation of the unintended consequences of private economic activities into socially defined risks and hazards is the result of 'scientific battles' fought out by 'intellectual strategies in intellectual milieux' over the heads as it were, of the class positions of the protagonists of the earlier industrial society. In this way the production and distribution of knowledge is central to the functioning of risk society. (Beck, 1992a p.112-114) [105]

Sub-politics: decline of the state as a political centre

However, this definition of risks, while the result of deliberate decisions (and therefore social in character), is not *political* in the sense of being defined by decisions taken in formal political institutions. The political system of industrial society is premised on a differentiation of parliamentary politics from the '*non*-politics' of the techno-economic pursuit of interests, which is expressed in private investment decisions and scientific research agendas, and it is primarily in this context that the decisions which produce ecological risks are made. It is in this sense that Beck speaks of social change as the *autonomised*, latent side effect of scientific and technological decisions in which social change is independent of the intentions of the formal political institutions. (Beck, 1992b p.183-4) [106] This process is not a distortion of modernity but rather the result of the success of rationalisation and progress, and occurs in part, through the equation of social and economic progress, assumed by modern Western culture. Risk society is thus shaped by two contradictory processes - the institutionalisation of representative democracy and the legitimation of the supposed intrinsic value of progress in scientific and technical knowledge - which leads to far-reaching social changes '*under the cloak of normality*'. The effect of this is to give scientific and economic development in late modernity the status of a '*sub-politics*' which is not subject to institutionalised political authorisation and legitimation. Nevertheless these constantly produce and magnify the risks which increasingly become the object of public discourse and over which government is called to act upon. [107]

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[105] 'The social and economic importance of knowledge grows ... and with it the power over the media to structure knowledge (science and research) and disseminate it (mass media). The risk society is in this sense also the science, media and information society.' (Beck, 1992b p.46).

[106] While *social* decisions create ecological risks and hazards, what people do intentionally is 'something quite different: they assert themselves in the market, use the rules of profit-making, carry forth scientific and technical inquiry, and in so doing they turn over the conditions of everyday life.' (p.184)

[107] 'Political institutions become the administrators of a development they neither have planned for nor are able to structure, but must nevertheless somehow justify.' (Beck, 1992b p.186-7) See also Beck (1992a) p.114-5.

According to Beck this results in a fundamental transformation of the character of politics in risk society, leading to three key developments. These are first, the cultural consensus over the link between scientific-economic development and progress begins to breakdown. Second the scientifically generated awareness of ecological and technological risks gives rise to demands for political control and accountability of processes that lie largely outside the public sphere. Third, the breakdown of the notion of a *political centre* that is capable of controlling the processes of scientific-economic development. Alongside these there occurs (paradoxically) a simultaneous extension of the monitoring activity by the state (and mass media and citizen groups) into ever more intimate levels of plant management. These phenomena are manifestations of a new phase of modernity Beck labels 'reflexive modernisation' in which industrial society is forced to confront the effects of threats created by its own technological 'success'.[108]

The 'sub-politics' status of scientific-economic development undermines the hitherto unquestioned belief in the inherent link between technological and social progress. The consensus that technical progress is equivalent to social progress Beck sees as based in the post-World War Two boom period, which in the Western industrialised states involved an interlinking of the economic, technical and social agendas of reconstruction. This consensus relied on the then obvious fact that increases in productive capacity would lead to an improved material standard of living. One aspect of this was to ensure that any adverse effects were regarded as the *social* consequences of otherwise beneficial technological development, which could be dealt with in isolation (and retrospectively) through the *political* intervention of the welfare state, without interfering with the basic *non-political* dynamics of technological development. [109] The post-war growth of

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[108] Beck defines reflexive modernisation in the following terms: By 'virtue of its inherent dynamism, modern society is undercutting its formations of class, stratum, occupation, sex roles, nuclear family, plant, business sectors and also of course the prerequisites and continuing forms of natural techno-economic progress. This new stage, in which progress can turn into self-destruction, in which one kind of modernisation undercuts and changes another, is what I call the stage of reflexive modernisation. … Reflexive modernisation … is supposed to mean that a change of industrial society which occurs surreptitiously and unplanned in the wake of normal, autonomised modernisation and with an unchanged, intact political and economic order implies the following: a *radicalisation* of modernity, which breaks up the premises and contours of industrial society and opens paths to another modernity. …This concept does not imply (as the adjective 'reflexive' might suggest) *reflection*, but (first) *self-confrontation*. … Let us call the autonomous, undesired and unseen, transition from industrial to risk society *reflexivity* (to differentiate it from and contrast it with *reflection*). The 'reflexive modernisation' means self-confrontation with the effects of risk society that cannot be dealt with and assimilated in the system of industrial society – as measured by the latter's institutionalised standards.' (Beck, 1994 p.2-6)

[109] In this situation 'technological development itself remains undisputed, is closed to (public) decision-making and follows its own inherent objective logic.' Beck also points to the role of the consensus between organised labour and capital as 'industrial bargaining parties' in

risk-intensive large-scale technologies with their systemic production of global ecological, nuclear and technological hazards and the 'incalculability' of their consequences, leads increasingly to the situation where these 'enter into a direct mutual relationship to collective lifeworlds, outside the industrial arena'. (Beck, 1992b p.203)

This new, knowledge-dependent experience of risks, combined with the success of the welfare state and formal democratic participation in the West leads to a new political culture that demands public participation in decision-making in areas previously outside the political system. In this regard social movements such as those concerned with ecology can be understood not as the response to some form of pathological distortion of the communicative and democratic potential of the modern welfare state, but rather as the product of its success. (Beck, 1992b p.185) This new political culture arises from the systemically induced decentralisation of politics brought about by the multiplication of centres of social and cultural sub-politics, which have the effect of disempowering the traditional notion of politics with its assumptions of the sovereignty of the state, parliament and the executive. [110] These centres of sub-politics, which Beck characterises as including new social movements and citizen action groups, as well as the mass media and the judiciary, thus broaden the 'opportunities for extra-parliamentary monitoring *with* and *against* the system.' (Beck, 1992b p.194 - emphasis added) It is important to note that while this process opens up avenues for resistance to scientific-economic development, it is still a process of *modernisation* which at the same time both decentres and channels the scope of formal political action. It also creates new opportunities for surveillance and intervention through the modernisation of the scientific-economic system. (Beck, 1992b p.200)

Beck's thesis is thus that the increased production and distribution of new types of risk simultaneously drive the 'self-politicisation' of modernity, in which

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economic growth and increasing productivity. The objects of dispute between these parties were those of wealth distribution, which was always approached from a 'common opposition to 'hatred of technology', 'Luddism', or 'critique of civilisation'.' (Beck, 1992b p.202)

[110] Beck suggests that 'the more successfully political rights were fought for, pushed through and concretely realised in this century, the more emphatically the primacy of the political system was called into question, and the more fictitious became the simultaneously claimed concentration of decision-making at the top of the political and parliamentary system. ... Both the formulation of ... program(s) and the decision-making process, as well as the enforcing of those decisions, must rather be understood as a process of collective action. ... This implies, however, that the official decision-making authority of political institutions is necessarily decentralised. The political-administrative system then can no longer be the only or the central locus of political events. In tandem with the democratisation, networks of agreement and participation, negotiation, reinterpretation and possible resistance come into being across the formal horizontal and vertical structure of authorisations and jurisdictions.' (Beck, 1992b p.191-2)

'the *concept, place and media of politics*' are altered fundamentally from those that which prevailed in the earlier phase of industrial society. (Beck, 1992b p.183) The implications of this for understanding the relation between the problem of nature, ecological movements, and modernisation is quite different from those that can be drawn from Habermas' treatment of these issues. He assumes ecological problems are largely a side effect of the material reproduction of society and are amenable to technical solution through improved science and technology and more efficient administration. Beck's analysis on the other hand points both to an integral link between the production of scientific knowledge *per se* and ecological hazards, and to a diminution of the capacity of the political-administrative system to control the production of these hazards. While Habermas sees ecological movements as an anti-modern reaction to the complexity of the social system, Beck emphasis is on such movements not only as a product of the latest phase of modernity but *also as a force for further modernisation*. Equally important is Beck's view that reflexive modernisation undermines the notion of the relative autonomy of the political-administrative system from the economic system, and of both of these from social and cultural spheres. Habermas' approach suggests that the weakening of the formal institutions of parliamentary democracy and welfare state, along with the rise of new social movements should be seen as elements of what he calls the 'new obscurity'. In contrast to this, Beck argues that the processes of modernisation are already bypassing the modernity Habermas seeks to 'complete'.

(3) Luhmann: ecological communication & functional differentiation

The theme of the lack of a political 'centre' to contemporary Western society, evident in Beck's work, also plays a key role in the work of Niklas Luhmann.[111] However, whereas Beck suggests that this leads to a reflexive modernity with the potential to reinvent politics through the 'self-criticism of risk society', (Beck, 1992b p.183-236; Beck, 1994 p.51-55) Luhmann is far more pessimistic about the possibility of a rational coordination of societal responses to ecological problems. Contrary to the approach of Beck and Eder, he argues that the various social subsystems are largely functionally autonomous. (Sciulli, 1994 p.44)

As with Beck, Luhmann does not situate ecological problems in nature, but within society. More specifically, he is concerned with developing a systems-theoretical understanding of the manner in which social systems become aware of, and communicate, the differences between themselves and their environment. Luhmann's work is discussed only briefly here. While his work does touch on the

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[111] A version of the following section of this Chapter previously appeared in Rutherford (1999a) p.106-109.

issues raised in this and previous chapters, his approach offer little of the insights available from Eder, Beck or indeed Habermas. Nevertheless, Luhmann's work, and in particular his book Ecological Communication, (Luhmann, 1989) represents a significant attempt to consider ecological issues within the context of contemporary systems theory. As I argue in Chapter 6, systems theory has been influential in ecological thinking over the past fifty years, and this influence does spill over into attempts at linking social theory to environmental concerns.

The distinction between system and environment is one of two key concepts in Luhmann's system theory. Here the concept of *environment* is understood at a very general level to refer to the context in which the 'operationally closed', self-referential, functional subsystems of society (the scientific, legal, political and economic systems, etc) operate as self-reproducing entities. Luhmann defines these functional subsystems as autopoietic,[112] to indicate 'that the system is the product of its own activity (work), and not simply self-sufficient activity as such'. (Sciulli, 1994 p.14) The autopoietic nature of functional subsystems is therefore determined, not by external environmental influences, but by the intrinsic primary goal of all such self-reproducing systems – 'the continuation of autopoeisis *without* any concern for the environment'. (Luhmann, 1989 p.14 - emphasis added) A second pivotal concept for Luhmann's theory is the substitution of 'communication' for 'action' as the most basic operation of functional systems, in which communication becomes the medium through which self-referentiality is produced and sustained. Communication is the process whereby social systems constitute themselves by *observing* themselves. Hence, the environment for Luhmann is 'anything which social communication can refer to.' (Miller, 1994 p.104)

When Luhmann does specifically address problems of ecology, his concern is to examine how modern societal subsystems react to these types of problems and to explain why 'society' has difficulty in perceiving and managing them appropriately. (Luhmann, 1989 p.33-5) His approach to these questions is shaped by a view of modern society as an assemblage of highly differentiated functional subsystems that *lack of any central mechanism to control these subsystems*, other than the uncoordinated reactions or autopoietic adjustments ('resonance') of each to the interference of the others. (Sciulli, 1994 p.47) This is so because each of the subsystems is directed to performing a relatively limited social function; for example, the subsystem of economy is narrowly concerned with prices and payments, rather than with the broader environment.

Luhmann argues that subsystems operate with a set of binary codes, which specify the ways in which reality becomes the subject of communication. Codes specify values and counter-values (in law: legal/illegal, in science: true/false) and

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[112] This is a concept taken from the work of Maturana and Varela in theoretical biology.

operate so as to exclude other possible ways of ordering reality. (Luhmann, 1989 p.44-5) Subsystems react to their environments (which include the other subsystems) only in the terms set out by these binary codes. It is only through these codes that systems are able to self-referentially differentiate themselves from their environment. Because the functional subsystems likewise can only discern and respond to environmental disturbances in terms of their own internal codes and meanings, the possibility of resonance between different subsystems is restricted to what can be communicated across subsystems as meaningful. Thus, 'each system has a different access to itself than to its environment which it can only construct internally.' (Luhmann, 1994 p14)

Several significant consequences flow from Luhmann's approach. First, talk of exposure to ecological risks is possible only where there is resonance, or reaction, by a social subsystem to events in its environment, including the other subsystems. Given that systems can respond only in accordance with their own particular structures or codes, ecological risks can be perceived by society only as exclusively *internal* phenomena. Physical and biological 'objective facts' have no social effect (resonance) unless they are the subjects of communication. Luhmann thus argues that society cannot communicate directly with its environment, but instead can 'only communicate *about* its environment' *within* itself. (Luhmann, 1989 p.28-31) The key question that results from this, is how does society structure the way it deals with environmental information? Here Luhmann points to an apparently insoluble paradox. Modern society, as a highly differentiated set of functional subsystems, structures communication about itself through binary codes, so that resonance between society and its environment is always directed through one of the functional subsystems and their associated programs (scientific theories, legal rules, etc). The differentiation of society is a result of its increasing complexity; yet the mechanisms for dealing with this complexity (functional subsystems, coding, etc) operate by *reducing information*, that is, by *simplification*. (Luhmann, 1989 p.18-9)

Here Luhmann is of course pointing to the reductive character of modern expert knowledge systems. He rejects those (such as Husserl) who criticise modernity on the basis of its tendency towards a one-dimensional 'technicalisation (that) forgets the 'lifeworld'.' (Luhmann, 1994 p.17) Such technicalisation is a fundamental characteristic of modern science, and in a move similar to that adopted by Habermas, Luhmann dismisses the critique of science and technology on this basis as a futile exercise. (Habermas, 1982b; Luhmann, 1994 p.18) In much the same way as Beck, Luhmann also rejects attempts to base solutions to ecological problems on some new form of environmental ethics. (Beck, 1992a; Luhmann, 1989 p.xvii) Neither is a solution to be found in science, for, as a function subsystem, it cannot provide 'meaningful' solutions that would be recognised within other subsystems (politics, law etc). Paradoxically, the functional complexity of modern society relies on the ability of science (and other

subsystems) to reduce the epistemic complexity of the world through codification. Science and technology thus construct simplifications that are then 'experimentally' reinserted into the world as a 'simplification that works', but only within its own subsystem domain. (Luhmann, 1994 p.18) Why these should 'work' is of course a significant problem in itself. The way in which scientific simplifications are translated from the laboratory into the broader society is a key issue that shall I return to in Chapter 8, where I consider the work of Latour and actor network theory.

Eder's criticism of Habermas' rigid separation of system and life-world applies with even greater force to Luhmann's systems theory. Similarly, the aspect of Beck's work which make it both potentially theoretically interesting and useful - the elaboration of the connections between science and politics - is systematically discounted by Luhmann. As a result of this, Luhmann appears to effectively reject the ability of politics to offer any solution to ecological problems. Luhmann carries Habermas' relegation of ecological problems to the status of skirmishes at the interface between system and life-world even further. Indeed, it is possible to argue that for Luhmann ecological problems amount to little more than system-generated 'noise', which is incapable of providing a meaningful basis for coordinated action across subsystems and across an increasingly complex environment. Beck (1994) is highly critical of Luhmann's argument regarding the self-referentiality of functional subsystems. He suggests that the autonomy of subsystems in Luhmann's systems theory elevates the notion of self-referentiality 'to the level of virtual autism'. (p.24-5)

Conclusion

In contrast to the limited scope for ecological 'communication' between the political and scientific subsystems afforded by Luhmann's work, both Eder and Beck suggest that the processes of late modernity systematically multiply the interactions between science, technology and politics. Both of these writers suggest that the focus of politics has moved away from the formal political-administrative institutions of the state as the centre of political action and power. Each in his different way points to an understanding of politics that acknowledges the central role of the capacity to define and structure social actions through the 'definition making power' of expert knowledge and a range of sub-politics that operate beyond the formal institutional structures of the political system. Such a perspective of 'government' beyond the state is of course a central theme in the work of Michel Foucault. Foucault's view of modern power as 'biopolitics' and his notion of governmentality are considered in detail the following chapters, where I argue that such an approach is capable of providing significant theoretical insights into the contemporary problematisation of the natural environment.

Chapter 5

Foucault and critical theory: the debate on power

Introduction

Previous chapters have sought to examine the links in contemporary social theory between notions of societal rationalisation and modernisation, and relationship of these to the problem of nature. The current chapter introduces discussion of the work of Michel Foucault, in particular the pivotal debate between Foucault and Habermas on power and rationality. Following an initial examination of this important theoretical dispute, I consider, in a somewhat more general sense, Foucault's relationship to the broad tradition of critical thinking that extends from Weber to Habermas, and which characterises modernity in terms of processes of societal rationalisation. The aim of the current chapter is to provide the theoretical setting for a detailed consideration, in subsequent chapters, of Foucault's notions of biopolitics and governmentality, and of whether these provide the basis for reconceptualising the contemporary ecological problematisation of nature in terms of such biopolitics.

Foucault: modern power and rationality

It can be argued that like both the Frankfurt School and Weber, Foucault's work also demonstrated a general concern with the processes of rationalisation in society. (Grumley, 1989 p.183-227; Rabinow, 1984a p.13) However, unlike this German social theory, Foucault's work did not start with the threat posed by instrumental rationality to the freedom and autonomy of the human subject. Rather he was concerned with demonstrating how such technical rationalisation and other objectifying processes produced the human subject in its modern form. Thus from the outset Foucault's project is not concerned with realising the Enlightenment ideal of the emancipation of the subject,[113] but rather with explaining how the application of rationality in particular historical relations of power and knowledge gave rise to the modern subject. His task was not the realisation or completion of the 'project of modernity' but understanding the facticity, or more accurately, the genealogy, of modernity itself. (Foucault, 1984b p.38-50; Foucault, 1991c p.102-4)

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[113] I qualify this statement in later Chapters of this thesis, especially Chapter 7, where I argue that Foucault fails to make as complete a break with the ideals of the autonomy of the subject as is sometimes suggested.

Like Habermas, Foucault was also deeply occupied with the question of 'communicative action'. Habermas' concern is to articulate a largely trans-contextual, and in some respects transcendental, theory of communicative reason, whereas Foucault's approach can be seen as concerned with analysing communicative, or more accurately, *discursive practices* as inseparably linked to relations of power. Thus while both share a concern with the question of language and the conditions under which discourse occurs, they approached the problem from different ontological assumptions. For Habermas the operation of power is linked to the domination of instrumental or technical rationality over practical reason. It is associated with the distortive effect of ideology in concealing the ways in which human autonomy can assert itself. Foucault, on the other hand, regarded power as the matrix in which social relations and social practices become possible and function. Power is thus 'coextensive and continuous with life...(and)...is linked with a production of truth.' (Foucault, 1982 p.214) Unlike the *ideologiekritik* of critical social theory, which sees power as mystifying and distortive of truth, Foucault's understanding of power focused on the capacity of power to effectively define 'regimes of truth', that is, as productive of 'truth' as opposed to 'falsity'. (Gordon, 1980a p.237; Hoy, 1986 p.123-147)

As a consequence of these differences, Foucault's work may be characterised by a series of closely interconnected concerns – understanding the historical constitution of the subject, the problem of the relationship between power and knowledge, and rationalities of government. In his essay 'The Subject and Power', Foucault outlined three modes of objectification through which human beings are constituted as subjects. The first of these was the objectifying of human being through making it the object of various types of formalised, scientific knowledge. Second, the objectifying of human being through 'dividing practices' whereby the subject is divided within itself and from others. Third, the processes by which human beings 'turn themselves' into subjects. (Foucault, 1982 p.208) These objectifying processes, in one form or another, lie at the core of Foucault's extensive work.

Foucault understood the disciplines of the human sciences as discursive practices that define, in a more or less systematic manner, the objects within their domain. Foucault argued that these scientific discourses, (covering the same domains of 'life, labour and language' singled out by Habermas) [114] underwent abrupt changes in the way statements were formulated and accepted as true, contrary to a progressivist view of the growth of knowledge. His analysis of these discourses indicates they displayed a certain internal coherence and autonomy

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[114] In The Order of Things Foucault examines the emergence of the what he calls the 'modern episteme', linking this to the birth of the human sciences, through a detailed examination which juxtaposes the analysis of grammar, natural history and economic thought in the Classical and Modern periods. (Foucault, 1970)

while being firmly embedded in historically specific disciplinary practices and institutional contexts. (Rabinow, 1984a p.8-9) In treating 'discursive formations' in this way, Foucault argued that the knowledges produced by the human sciences cannot be regarded as true in a universal sense, but must be seen as socially contingent and in some respects closer to 'ideology' than 'fact' in a realist sense. [115]

In works such as Discipline and Punish and Madness and Civilisation, Foucault dealt with the varied processes, particularly the expansion of the human sciences, by which modern society progressively classified, controlled and confined parts of the social world. Of particular interest to Foucault were the ways in which the human body became the object of both these scientific discourse and 'dividing practices', ie practices of social objectification and categorisation. Through a combination of the classificatory power of scientific discourse and exclusory social practices, such as confinement, the social and personal identity of the subject is structured.

The last of these modes of objectification identified by Foucault can be described, following Rabinow (1984b), as 'subjectification'. In the other two modes of objectification, the subject is treated primarily as a docile body that is defined, divided and confined by externally operating disciplinary and discursive forces. (Foucault, 1979b p.135-169) Subjectification by contrast is essentially a self-formative process, involving the active participation of the subject in its own constitution, through a process of self-understanding that is frequently 'mediated by an external authority figure, be he confessor or psychoanalyst'. (Rabinow, 1984b p.11) Foucault's notion of subjectification thus breaks with the traditional subject-object ontology in that subjectivity is no longer privileged as the centre of human autonomy. Technologies of power (the techniques of administration, definition and control of the subject) both result from an active process of subjectification of the self by the self, as well as from processes of objectification of the self by others. This is significant because it means abandoning of the notion that power distorts or represses an underlying, essential human subjectivity. It indicates, in other words, that these objectifying and subjectifying processes do not distort the 'true' nature of human beings, but in fact create the truth of the subject. (Foucault, 1979b p.194)

Foucault's work examined the historical emergence, since the seventeenth century, of what he referred to as disciplinary practices or technologies of power. This, he argued, was a modern form of power differing substantially from the earlier sovereign power of the monarch. Sovereign power dealt with its subjects in a singular and relatively uniform fashion. The everyday life of individuals was not

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[115] Foucault was nevertheless highly critical of the notion of ideology particularly as used in Marxist theory. See Foucault (1980d) p.117-9 and Barrett (1991) p.123-156.

tightly regulated by the sovereign, and the assertion of power when it occurred involved intervention, often in the form of violent spectacle, in order to symbolically demonstrate that power. Disciplinary power on the other hand represented a new technique, a new type of power:

> This form of power applies itself to immediate everyday life which categorises the individual, marks him by his own individuality, attaches him to his own identity, imposes a law of truth on him which he must recognise and which others have to recognise in him. It is a form of power which makes individuals subjects. (Foucault, 1982 p.211-212)

Foucault identified three key elements to this new disciplinary power - hierarchical observation, normalising judgement and the examination. Hierarchical observation established a connection between visibility and power in such a way that the 'apparatus of surveillance' produces the effect of power, and through which the subjects of power are rendered 'visible' as the target of power. The power of these hierarchical modes of observation is inherent to the apparatus of continuous surveillance and the control of the spatial distribution of the bodies of subjects. Foucault saw this sort of normalising judgement as an 'extra- or infra-legal penalty' brought to bear over non-conforming behaviours, through which the separation of normal from abnormal or deviant behaviour can be effected. The effectiveness of this form of power does not come primarily from 'repression', but rather through 'gratification' and reward for the adoption of 'normal' modes of being and doing. Disciplinary power both specifies the range of key behaviours that go towards constituting the individual and directs attention towards the implementation of normalised (and *normalising*) behaviour. The other element of modern power, the examination, brings together surveillance and judgement in what Foucault referred to as the 'normalising gaze', a technique or practice through which individuals are classified so as to constitute a population, against the norms of which they are judged and regulated. (Foucault, 1979b p.189-90) Central to Foucault's concept of the examination is the creation of the individual as a 'case' about which information is recorded and statistically incorporated into data archives that are then used in programs of management for both the individual and the larger population. Foucault made the point that this represented the beginning of the 'sciences of man', and in the process increasingly brought ordinary, everyday human existence into the descriptive domain of the formalised discourses of the human sciences.

This modern form of power also refined the Christian practice of confession, and incorporated it into that older technique of subjectification described by Foucault as *pastoral* power. Characteristic of the Christian pastoral was its use of individualisation aimed at spiritual salvation. Pastoral power sets up a situation of constant self-examination, of opening up the individual's inner-most being to the scrutiny of conscience and through this the self-conscious submission to the will and direction of a superior being (mediated through the confessor). This was not a

matter of self-examination as a means to self-mastery in the interests of the polity as understood by the Greeks, but a question of overcoming illusions within the self, of a constant examination of one's own conscience and thoughts in order to realise the pure Christian self. (Foucault, 1981c p.236-40) Thus according to Foucault, the pastoral technique becomes a constitutive element in the formation of the subject, by establishing a 'link between total obedience, knowledge of oneself, and confession to someone else'. (Foucault, 1981c p.239) For Foucault, the modern state came to adopt a new, non-ecclesiastical form of this pastoral power, a 'matrix of individualisation' in which spiritual salvation was increasingly replaced by a civil salvation of physical well-being and social security. With this appropriation of the techniques of pastoral power came an expansion of the *social* field, resulting in a new configuration of individualising power that focused on the development of knowledge of human beings on two levels: 'one, globalising and quantitative, concerning the population; the other, analytical, concerning the individual.' (Foucault, 1982 p.215)

In considering the specific nature of power, Foucault pointed out that power is more than simply a relationship between agents. Relationships of communication and relationships involving the technical capacities of bodies and instruments to manipulate things, are not in themselves relations of power, although they may, and often do, interact in a concerted way with relations of power so as to constitute blocks of interaction that Foucault described as 'disciplines'. (Foucault, 1982 p.217-219) Foucault's view of power was strongly *relational*. Power relations are fundamentally constituted in social interaction; they are not to be understood as 'superstructural' or ideological. Power is not synonymous with 'force', 'violence' or 'capacity', all of which act directly upon bodies and things.[116] The defining feature of a relationship of power says Foucault, is that it is a network of relationships, a 'mode of action':

> which does not act directly and immediately on others ... It is a total structure of actions brought to bear upon possible actions ... (It is) a way of acting upon an acting subject or acting subjects by virtue of their acting or being capable of acting. (Foucault, 1982 p.219-220)

In this approach subjects must therefore be free to act, and are able to do so as long as the field of possibilities for action remains open. The relationship between subjects, said Foucault, is a dynamic tension, an 'agonism'. Furthermore, the configuration of relations of power within any particular social context is a historical product, and as such, specific relations of power are neither necessary nor immutable, but rather open to transformation and change. Foucault's concept

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[116] In Chapter 7 I discuss the distinction Foucault made between 'power' and 'capacity' and criticise this as adopting an unnecessarily 'positivist' attitude towards the natural sciences which is not consistent with his approach to the human science.

of power therefore consisted of far more than the negative power of domination and repression. (Foucault, 1980e p.98)

Foucault did of course concede that power relations often result in relations of domination and methods of subjugation, 'even violent means of material intervention'. (Foucault, 1980e p.96) Nevertheless, rather than conceiving of relations of power as primarily repressive, he sought to understand the productive modes of subjection as central to the formation of modern subjects and the knowledge of them as embodied in the human sciences. He was therefore concerned with the mechanisms of objectification and subjectification outlined earlier this section. In these processes there can be recognised a 'positive' or productive aspect of power relations that produces and transforms knowledge, truth, discourse, and emotion. (Foucault, 1980d p.119) [117] Individuals (and groups) are not merely the docile objects on which power operates, but also the result of complex networks of social relations through which power is exercised and articulated. Foucault's genealogical approach to the constitution of power, knowledge/discourse and subjectivity is thoroughly historical and social while seeking to dispense with notion of the subject as founded on some transcendentally given quality. [118] Foucault thus shared with Habermas a desire not to rely on the philosophy of the subject or consciousness in understanding the modern individual. As with Habermas, he too made use of a concept of differentiated rationality, but again, rather than invoking a 'categorical' division of rationality, [119] Foucault's approach was a functional one in which the significant forms of rationality were historically specific *strategies*, *technologies* and *programs* of power. According to Colin Gordon, these three general forms of rationality served as a means of

> conceiving relations of power in terms of the differential and differentiated interaction between distinct orders of historical events. In order to understand these concepts, it is necessary to keep in mind a basic distinction between three such general orders of events: that of certain forms of explicit, rational, reflected discourse; that of non-discursive social and institutional practices; and that of certain effects produced within the social field. (Gordon, 1980a p.246)

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[117] Foucault asserts that 'One of the prime effects of power (is) that certain bodies, certain gestures, certain discourses, certain desires, come to be identified and constituted as individuals.' See also Foucault (1982) p.220-223. For discussion on this see Patton (1989) p.260-276 and Krips (1990) p.170-182.

[118] For possibly the clearest statement of the social nature of Foucault's notion of power see his essay 'The Subject and Power' (Foucault, 1980d).

[119] I refer here to Habermas' Kantian differentiation of rationality into instrumental, practical and critical categories.

Foucault was not suggesting that disciplinary power constituted a regime of total domination. Rather it provided a tool for identifying the disjuncture between the orders of discourse, practice and effects, and focused attention on the significance such discrepancies might have for the development of specific historical formations of power/knowledge. In effect said Foucault, there existed a dynamic, reciprocal relationship between power and 'strategies of struggle', in which there was always thus 'a perpetual linking and a perpetual reversal.' (Foucault, 1980d p.226) [120] Programs and technologies of power in Foucault's work relate to the formation and reproduction of subjects and relations of power, whereas strategy was the 'instrumentalisation' of the reality created by these programs and technologies. (Gordon, 1980a p.250-251) Understood in this way strategy signifies a non-discursive, '*anonymous'* rationality in that while these involve struggle or 'agonism' between subjects, there is no sovereign subject or centre that can be said to consciously program or orchestrate the playing out of this dynamic. Foucault thus argued that all power relations imply, at least potentially, a 'strategy of struggle', and that a 'strategy proper to power relations (exists) insofar as they constitute modes of action upon possible action, the action of others.' (Gordon, 1980a p.225) Thus a strategy of power is the interplay of programs and technologies of power, along with the 'historical decipherment' of the potential for employment of the effects of these same programs and technologies of power. (Foucault, 1982 p.225-6; Gordon, 1980a p.246-258)

The argument that power operates through anonymous, 'centre-less' strategies has much in common with the approaches of theorists discussed in other chapters. In particular it recalls the work of Ulrich Beck, who points to the 'autonomised' direction of social development by the interaction of technological and market forces. Similarly, it resonates with the work of Bruno Latour and his colleagues, who I discuss in later chapters, when they argue that agency should be understood as a network-like property of the interaction of human actions and the capacities of material technologies. In all of these bodies of work there can be found attempts to account for the three 'general orders of events' referred to by Gordon (ie explicit, rational discourses; non-discursive institutional practices; and the effects these produce within the 'social field'). It could be claimed that Habermas' work also attempts to come to grips with these issues, but as I have argued the abstractness of his theory defeats this.

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[120] In this work (ie 1980d) Foucault adds that 'The consequence of this instability is the ability to decipher the same events and the same transformations either from inside the history of struggle or from the standpoint of the power relationships. The interpretations which result will not consist of the same elements of meaning or the same links or the same types of intelligibility, although they refer to the same historical fabric and each of the two analyses must have reference to the other.'

In the next section I consider Habermas' dispute with Foucault on the nature of power. Habermas' deficient view of power contributes substantially to his overall inability to appreciate both the degree to which the problem of nature reflects fundamental issues of the reproduction of the social system, and the importance of ecological movements and discourses in shaping responses to these issues.

Foucault and Habermas: the debate on power

At the end of Chapter 2, I dealt with Habermas' response to Horkheimer and Adorno's treatment of the 'dialectic of enlightenment'. Habermas argues that Horkheimer and Adorno's critique of instrumental reason parallels Nietzsche's critique of morality and scientific knowledge, in that both ultimately understand morality and truth as expressions of the drive for self-preservation and domination. This reduction of knowledge and morality to the Nietzschean will to power, in Habermas' view, undermines the basis for objective or universal claims to intersubjective validity, and therefore the basis of meaningful critique itself.[121] I indicated that this criticism of Horkheimer and Adorno also highlights the key theoretical differences between Habermas and Foucault. It is now necessary to turn to a more specific consideration of the differences between Habermas and Foucault, and to what I consider as the most significant deficiency of Habermas' critical theory - his overly abstract and limited understanding of power. In considering the 'debate' between Habermas and Foucault on this point, [122] I argue that Foucault's approach to the relationship between power and knowledge is far more satisfactory than Habermas'. The usefulness of Foucault's theoretical approach, with specific reference to problem of nature and biopolitics, is a theme that is then taken up more detail in Chapter 6 of this thesis.

Habermas' critique of Foucault is most systematically developed in two essays published in The Philosophical Discourse on Modernity. (Habermas, 1985 p.238-265, 266-293) Here, following the line of attack deployed against Nietzsche, Horkheimer and Adorno in other essays in this collection, he criticises Foucault on three methodological grounds: 'presentism', relativism and 'crypto-normativism', which he sees as leading to a lack of political commitment and conservatism. (Habermas, 1985 p.276; Isenberg, 1991 p.301) By presentism Habermas designates a methodological failure in Foucault's approach that, while seeking to 'eliminate the hermeneutic problematic' through adoption of a strictly external, 'structural' standpoint for analysis of power relations, fails to achieve 'objectivity'. Instead, argues Habermas, Foucault cannot escape the inevitable hermeneutic pre-understandings that lies behind all historical analysis. By

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[121] See Chapter 2 of current thesis and Habermas (1982a).

[122] Others of course largely carry on this 'debate'.

refusing to confront this, claims Habermas, Foucault cannot admit that he described the emergence of modern domination in terms of 'the very biopolitics' he seeks to explain, thus producing histories that are 'narcissistically oriented' toward the use of the study of the past 'for the needs of the present'. (Habermas, 1985 p.277-8) Of course, far from seeing this as a criticism, Foucault in fact explicitly saw it as one of the tasks of his work. [123]

Habermas' second charge is that Foucault's historiography falls into relativism. Foucault defined truth as internal to the discourses that produce it, with the result that, in Habermas' view, 'the meaning of validity claims consists in the power effects they have.' (Habermas, 1985 p.279) Historical analysis therefore can only reveal a functional 'self-maintenance' of discursive practices. As a consequence of this concealed self-referentiality, Foucault's attempts to create a counter-knowledge to the human sciences, which would give voice to subjugated local forms of knowledge, is self-defeating for the reason that 'every counterpower' is itself an expression of power. Hence argues Habermas, the overthrowing of existing hierarchies of knowledge by subjugated ones merely establishes a new hierarchy that cannot lay claim to a validity or truth content that would 'transcend local argument'. (Habermas, 1985 p.281) As Janicaud indicates, in this second prong of his attack on Foucault's relativism, Habermas shifts his criticism from the empirical to the transcendental by attempting to 'unmask a second-degree relativism which is the inverse of self-justification (ie his first criticism): a self-reference which is self-defeating.' (Janicaud, 1992 p.288)

The third of Habermas' criticisms is that of 'crypto-normativism'. Here he claims that Foucault suffered from the same problem of which he accuses the human sciences. Thus he argued that while Foucault's genealogy sought to bracket itself off from value judgement and adopt a purely descriptive attitude, Foucault nevertheless clearly adopted particular normative positions but refuses to engage in any serious theoretical discussion as to their justification. Instead Foucault appeared to present engagement in terms of strategic resistance and the mobilisation of local counterpower. Habermas argues that despite Foucault's refusal to engage in the 'counter-discourse' within modernity, he surreptitiously locates the justification for resistance in a vitalistic '*Lebensphilosophie*' based in 'the body's experience of itself' as subjected to disciplinary force of biopower, a position that he nevertheless rejected in his writings. (Habermas, 1985 p.285) Habermas' three criticisms are in fact the same charge expressed from the various standpoints of signification, truth and value. (Janicaud, 1992 p.291) All three criticisms focus on the alleged inability of Foucault's theory in providing a secure,

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[123] Thus in discussing his work on psychiatric hospitals, Foucault insists 'My work was undertaken only as a function of those conflicts. The problem and the stake there was the possibility of a discourse which would be both true and strategically effective, the possibility of a historical truth which could have a political effect.' (Foucault, 1980c p.64)

universalisable grounding for claims to truth and validity which Habermas' regards as fundamental to the possibility of critique.

Habermas sees these methodological problems as deriving for a 'systematic ambiguity' running through Foucault's notion of power. He argues that Foucault's genealogy served both an empirical function of analysing the historical formation of technologies of power, and a metatheoretical role that sought to explain the transcendental conditions under which any scientific knowledge is possible. (Habermas, 1985 p.274) Habermas sees these two tasks as separate and irreconcilable, claiming that Foucault's unacknowledged reliance on a transcendental and 'unsociological' Nietzschean notion of power underpins the 'empirical shortcomings' of his work. Habermas is perhaps correct to point to the metaphysical-transcendental element of Foucault's concept of power, inasmuch as it is based on the notion of a will to truth, although Foucault's position on this is ambiguous. Foucault argued that the form of power he was concerned with is a modern development that arises at a particular historical juncture. He also insisted that his studies 'always analyse quite precise and localised phenomena: for example, the formation of disciplinary systems in eighteenth-century Europe.' (Foucault, 1991b p.167) However, having established that the form of disciplinary power he is concerned with has a historical genesis, he did often tend to speak of it as a 'modality of intervention', that is, as a generalised type of political technology, as a 'diagram' or 'schema', as 'panopticism'.[124] However, Habermas' criticism is somewhat weakened by his own reliance on equally metaphysical assumptions about the ontological primacy of communicative reason, which he (similar to Foucault) identifies as the product of a particular set of historical conditions (modernity) but which once in existence take on a universal, 'quasi' transcendental function.

As I have indicated, the crux of Habermas' criticism is the charge that Foucault's theory of power undermines the possibility of an emancipatory critique of power. The source of the problem is that he sees Foucault's use of power as 'reversing' the relationship between truth and power, so that truth becomes dependent on power. (Habermas, 1985 p.274) This is problematic for Habermas' theory precisely because he remains bound to a traditional view of power as domination, as repressive, a view enunciated not only in Habermas' own works, but also spelt out in detail by critics such as Taylor and Fraser. [125] Habermas criticises Foucault for failing to differentiate between the will to power and the will to knowledge. (Janicaud, 1992 p.290, 300) Of course, Habermas does not entertain the notion of completely disinterested knowledge. However, even

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[124] For a useful discussion of the 'ambiguous' use of the idea of biopower by Foucault, see Donnelly (1992) p.199-203. See also Barret-Kriegal (1992).

[125] For discussion of this see Fraser (1989); Connolly (1985); Taylor (1984), (1985); Patton (1989), (1994); Bove, (1988).

though human interests shape knowledge, these are the generalised interests of the species. Although he moved away form the use of the notion of cognitive interests *per se* because of its link to the philosophy of the subject, even at the time of Knowledge and Human Interests he tied the interest in emancipation from power to the production and acquisition of knowledge. (Habermas, 1978 p.286-7) Already at that point, Habermas understood emancipation as predicated on the communicative logic inherent in human language, which by its very nature 'expresses unequivocally the intention of universal and unconstrained consensus.' (Habermas, 1978 p.314) This view is preserved in the shift to the theory of communicative action. Indeed his criticism of Foucault's treatment of truth as the product of power is that it makes power 'subjectless' and therefore no longer bound to 'the competencies of acting and judging subjects' that enable the formation of a rational consensus between subjects which is central to his own theory. (Habermas, 1985 p.274)

In another commentary on Foucault Habermas argues that power subverts the 'normative standards of the analytic of the true'. (Habermas, 1989 p.178-9) This is not to suggest that Habermas necessarily believes that power can be fully overcome at the level of the individual. Indeed his attempt to incorporate systems theory in his Theory of Communicative Action is based in part on a recognition of the heteronomous forces within the economic and administrative 'subsystems' of the society that condition social actors. Nevertheless he retains the philosophical commitment of his Frankfurt School predecessors to the ideal of the person as an autonomous agent. [126] As Hindess (1996) indicates, for this sort of critical theory the 'impact of power is identified in terms of a difference between the real and the postulated ideal.' Thus for Habermas power is posited primarily as a largely abstract counterfactual to the ideal of a power-less, autonomous, rational process of intersubjective consensus formation, rather than in the more empirical sense adopted by Foucault in which its role is to describe the 'effects of identifiable conditions and processes'.

The difference between these two approaches to power is linked to differences in the way the notion of reason is understood. Hoy has characterised this succinctly in the following terms: 'Whereas Foucault is ... interested in the historicity of reason, Habermas is interested in the theory of reason.' (Hoy, 1994) Despite Habermas' critique of Horkheimer and Adorno's 'one dimensional' view of reason, his own differentiation of reason remains largely ahistorical and abstracted from specific social contexts. In conjunction with his commitment to a universalised communicative rationality, this leads him to see theories or social

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[126] Without also retaining what Foucault saw as their refusal of the Enlightenment 'blackmail' implicit to Habermas' critique of Horkheimer and Adorno, (and Foucault); that is, the view that 'operates as though a rational critique of rationality were impossible.' (Foucault, 1983 p.201; 1984b p.44-5)

forces that challenge his particular conception of reason as a challenge to rationality *per se*, as well as to 'modernity' as the generalised bearer (at least potentially) of the evolution of reason and hence human autonomy. As indicated in Chapter 3, this results in Habermas interpreting many new social movements, and particularly ecological movements, as essentially anti-modernist and therefore potentially irrational. A similar move is apparent in his characterisation of the early Frankfurt School and French theorists such as Foucault as anti-modernist and 'neo-conservative'. In this instance, Habermas sees Foucault's work as an attack on the resources of modernity. In effect, Habermas regards Foucault's (and Horkheimer and Adorno's) understanding of truth and knowledge as determined by power relations as representing a 'repudiation of enunciative discourse altogether'. (Margolis, 1993 p.46)

However, as Margolis has argued, Habermas' project lacks the degree of grounding and universality it claims for itself. Habermas admits that the rationality of argumentation ('the unforced force of the better argument') is an 'idealisation', something that 'discourse participants always have to suppose'. (Habermas, 1985 p.130) He in fact conflates empirical and transcendental (metatheoretical) arguments as to the character of communicative reason, the very criticism he levels at Foucault's use of power. First, he claims that it is implicit to everyday social processes, that is, the communicative potential of reason derives from actual cultural processes for achieving mutual understanding within the life-world. At the same time he claims that communicative reason has a 'purely procedural character' and as such is 'quasi-transcendental'. (Habermas, 1987 p.314-6) Thus communicative action is a cultural achievement in the evolution of society and simultaneously an ontological condition necessary for any form of social existence. However, in terms of empirical adequacy, Habermas fails to provide any evidence as to when such 'uncoerced consensus' actually occurs, in contrast to Foucault's provision of considerable historical detail in support of his claims about the emergence of modern forms of discipline. Indeed Habermas also fails to explain how it would even be possible to know whether any instance of consensus escapes the more subtle forms of coercion and deception present in social interactions. (Margolis, 1993 p.49)

Introducing this 'systematic ambiguity' at the heart of his own critical theory does not help Habermas avoid explaining how discursive inquiry can posses a universal validity while at the same time being 'inseparable from whatever unreason ... lies embedded in the practices of actual life.' (Margolis, 1993 p.49-50) The consensus of Habermas' ideal speech situation, even if posed in its weakest form as an ideal to be striven for, assumes a neutrality and transparency in discourse that is not simply utopian but also seriously flawed sociologically. Apart from the mere assertion that there are 'unavoidable communication presuppositions of augmentative discourse' (Habermas, 1985 p.130) Habermas is unable to provide any compelling justification for accepting that communicative

reason is capable of providing a secure grounding for universal (or even potentially universalisable) truth or normative standards. As Margolis insists, there 'is no reason in the world why "the unforced force of the better argument" is anything more than a purely local appraisal.' (Margolis, 1993 p.50-1) Thus Habermas' criticisms of Foucault regarding the lack of empirical adequacy and the conflation of empirical and metatheoretical tasks are equally applicable to his own arguments. It appears that Habermas' own theory is as guilty of being 'narcissistically oriented' as is Foucault's. This does not necessarily strengthen Foucault's position, but does weaken the grounds upon which Habermas can claim a theoretical superiority for his own.

Habermas' mischaracterisation of Foucault's notion of power represents a more substantial problem for his critique. In this context, Kelly has argued that a central issue in the dispute between the two theorists has been Habermas' misunderstanding of the relationship between *juridical* and *disciplinary* power in Foucault's writings.[127] Kelly suggests this is the result of Habermas' tendency, in The Philosophical Discourse on Modernity, to base his criticisms on a one-sided reading of Foucault's notion of power in Discipline and Punish. (Kelly, 1994b p.366-7) From this Habermas extracts a view of Foucault's project as describing the 'victory of regulatory reason' which is seen as a process of continuous and generalised augmentation of discipline and domination in modernity. (Habermas, 1985 p.245) Here Habermas' reading of Foucault closely follows that of Honneth. (Honneth, 1991) Both interpret Foucault as suggesting power in modern society operates on the model of the total institution, that is, as a totalising and all pervasive repressive discipline. Neither demonstrates a broad awareness of Foucault's discussions of power beyond his main books, and even this awareness goes little beyond Discipline and Punish, and occasionally the first volume of History of Sexuality. [128] Not only is this reading of Foucault deficient, as a comparison with the general discussion of his notion of power in the first section

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[127] 'Juridical' power refers to the sovereign view of power discussed earlier in this chapter, in which power is traditionally understood as the possession of a centralised political authority (such as the State) or social class, the 'exercise' of which is conceived in terms of prohibition or repression.

[128] In particular, neither author substantially engages Foucault's more specific comments on the nature of power contained in numerous articles and interviews, nor his work on governmental rationalities and liberalism. Habermas refers approvingly to Honneth's work on Foucault in The Philosophical Discourse on Modernity (Habermas, 1985 p.255, 268) and generally follows a similar approach, although with much less detail or rigour. Honneth's work (the parts on Foucault) was submitted as a dissertation in 1983 and first published in German in 1985, the same year as the German edition of Habermas' The Philosophical Discourse on Modernity, although Habermas was clearly familiar with this in preparing his own work. Both Honneth and Habermas cite some passages from interviews in the Power/Knowledge collection, but neither appears familiar with important works of Foucault such as 'The Subject and Power' (1982), his lectures delivered at the College du France between 1970 and 1984, nor his 'Governmentality' essay, which first appeared in English in 1979.

of this chapter would indicate, but both Honneth and Habermas also attribute to Foucault a view of societal rationalisation as an all-embracing phenomenon. However, to employ Hoy's (1994) characterisation referred to earlier in this chapter, Foucault is not concerned with a theory of rationality that discerns the general principles of Reason, but rather with the history of particular rationalities. Thus Foucault's genealogies emphasise the 'local and contingent aspects' of specific rationalisation processes 'without assuming any necessary coherence overall' as do both the early Frankfurt School and Habermas. Of course, as Hindess emphasises, the significance of this difference between Foucault and the Frankfurt tradition, while real should not be overstated. (Hindess, 1996) The move from the universal to the singular in Foucault involves shifting the focus of the Kantian critique rather than an abandonment of it, as I argue in Chapter 7.

Kelly's analysis demonstrates that Habermas' reading of Foucault fails to understand the local and contingent character of the power relations described by Foucault. Hence Habermas (1985) wrongly attributes to Foucault the view that the disciplinary power (ie panopticism) 'found in modern punishment is characteristic for the structure of societal modernisation *as a whole*.' (p.288-9 - emphasis added) Not only did Foucault explicitly deny that modern society is a disciplinary society 'in all its aspects', [129] his analysis of panopticism in Discipline and Punish did not, as Habermas appears to suggest, claim that modern discipline was dispersed into society *in general* from the prison. (Foucault, 1979b p.138, 224; Kelly, 1994b p.366-371) Kelly also argues that by construing Foucault's notion of disciplinary power in largely traditional terms, Habermas fails to appreciate the distinction between it and juridical power. Contrary to the inference drawn by Habermas' commentary in The Philosophical Discourse on Modernity, Foucault did not argue that juridical modes of power are no longer important. The claim was rather that the preoccupation of political theory (on both the Right and the Left) with a 'juridical schematism' that unfailingly characterises the nature of power as repressive and negative had stood in the way of critical-empirical investigation of the actual operation of power in historically specific contexts. (Foucault, 1980d p.115-6, 118-127) Thus Foucault argued that it is necessary to understand modern power in terms that encompass not only the legal-juridical functions of the State, but also those myriad 'micro-level' practices and techniques that 'necessarily extend beyond the limits of the State'. (Foucault, 1980d p.122) He did not claim that the State is unimportant, or that juridical power has disappeared, [130] but rather that the State can only operate by virtue of

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[129] See particularly Foucault's rebuttal of the charge that he fails to distinguish between democratic and totalitarian regimes, in Foucault (1991b) p.166-70.

[130] Habermas argues that 'As soon as Foucault takes up the threads of the biopolitical establishment of disciplinary power, he lets drop the threads of the legal organisation of the exercise of power and the legitimation of the order of domination.' (Habermas, 1985 p.290)

already existing relations of *positive* disciplinary power at the micro-level of society. Power then for Foucault is not reducible to these negative and prohibitive juridical-administrative functions of the State; in fact he argued that this disciplinary biopower had come to be necessary to the continued existence and operation of these juridical functions. (Foucault, 1980d p.122) [131] As Kelly suggests then, while the disciplinary and juridical modes of power frequently conflict and compete, they are also *correlative*. (Kelly, 1994b p.375-6) In the next chapter I discuss Foucault's notions of biopolitics and governmentality in detail.

Foucault's relationship to the German critical tradition

Before doing this I first turn to a more general consideration of Foucault's work in relation to the largely German tradition of critical thought on modernisation discussed briefly in earlier chapters. This is useful because Habermas' attacks on Foucault may suggest a greater degree of difference between the two than is perhaps warranted. This is a question I shall return to in Chapters 7 and 8 in my discussion of Foucault's incomplete break with the notions of human sovereignty and autonomy so cherished by both the Frankfurt School and Habermas (and one might add, Nietzsche). Perhaps of equal importance, however, it is important to recognise that despite the differences between the two on the question of power, both arguably share common intellectual roots in what are branches of a *European* critical tradition.

The significance of Nietzsche's influence on Foucault has been widely discussed. [132] In several interviews Foucault pointed to the significance of Nietzsche for his own thinking, describing his reading of Nietzsche as providing 'a point of rupture' and a 'revelation' in his intellectual development. (Foucault, 1983 p.198-9; 1988c p.13) Foucault indicates that his motivation for drawing on elements of Nietzsche's work was a concern with 'the possibility of elaborating a history of rationality' (and of knowledge) that is not based on the 'founding act of the rationalist subject'. He notes that the leading French historian of science, Georges Canguilhem, who was influential in his early studies, also shared an interest in Nietzsche and was 'thoroughly receptive' to the own to write such a history of knowledge and reason. [133] Foucault identifies two camps in post-World

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Habermas' comments here clearly reveal his lack of familiarity with Foucault's work on governmentality, security and liberalism.

[131] Elsewhere Foucault characterised this as the 'governmentalisation of the State'. Foucault, (1991c) p.103.

[132] See from example Dreyfus and Rabinow (1982) p.104-117; Lash (1984) p.1-17; Habermas (1985) p.238-265; Deleuze (1988). Foucault gave his most detailed consideration of Nietzsche in a 1971 essay published as Foucault (1984a) - see p.79-100.

[133] Canguilhem, whose main area of expertise was the history of biology and medicine, was one of Foucault's examiners for his second attempt for the agregation de philosophe at the Ecole

War Two French philosophy - a philosophy of the subject expressed in phenomenology, and a philosophy of 'the concept', of knowledge and rationality, represented by Bachelard's and Canguilhem's history of science. He locates his own concerns as firmly aligned with those of the second camp's 'historical critique of reason'.[134] Significantly, Foucault noted that in Germany the 'Frankfurt School and Lukacs, by way of Feuerbach, Marx, Nietzsche, and Max Weber' represented this line of critique. (Gutting, 1989 p.9-12) [135] Hence while rejecting many of the Statist assumptions of power inherited from Marxism, Foucault nevertheless saw his own project as having much in common with the tradition of social critique.[136]

Three key elements of Nietzsche's philosophy in particular were important to Foucault's project of doing a history of 'the concept'. First, Nietzsche relied on the notion of *becoming* in his understanding of the world, and as a consequence he argued that knowledge of the world is always perspectival. As the world ('being') is in a constant state of flux, a positivist conception of 'objective' or 'true' knowledge is rejected. What we 'know' is not reality ('being') but appearances that acquire a veneer of solidity in the history of cultural practices, through the imposition on the world of interpretations which have proven themselves useful. [137] A second consequence of the dependence of knowledge on historical-cultural

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Normale Superieure in 1951. (In his unsuccessful 1950 attempt at the agregration, one of Foucault's papers was on the theme of 'man's position in nature'). Canguilhem later became Foucault's 'supervisor' when he submitted Folie et deraison Historie de la folie a l'age classique (Madness and Civilisation) as his principal thesis for the doctorat es lettres in 1961, and reported in very approving terms on the topic and quality of the thesis. Foucault's 'complimentary thesis' was a translation and discussion of Kant's essay Anthropology from a Pragmatic Point of View. The conclusion of the complimentary thesis ends its discussion of Kant with a reference to Nietzsche's philosophy as 'finally putting an end to questions about man.' Thus while Foucault's 1971 article systematically appropriates Nietzschean themes, already in 1961 it is evident that Foucault had come to see Nietzsche as a resource in his attempt to come to grips with the 'history of reason'. For above bibliographic details see Macey (1994) p.45, 88-90, 103-6 and Bernauer (1988) p.120, 161.

[134] See Foucault's (1991d) discussion of the influence of Canguilhem and Nietzsche on his work.

[135] Gutting is here quoting from Foucault's essay 'La vie: l'experience et la science', in Revue de metaphysique et de morale 70 (1985), an earlier version of which appeared as the introduction to the English translation of Canguilhem's 1978, On the Normal and the Pathological. See also Foucault (1983).

[136] See Foucault (1991a) for Foucault's criticism of the Frankfurt School, and Foucault (1991d) for comments on Althusser.

[137] Nietzsche argues that the world, as that which is in a 'state of becoming' cannot 'in a strict sense be 'comprehended' or 'known'; only in so far as the 'comprehending' and 'knowing' intellect discovers a crude ready-made world put together out of nothing but appearances, but appearances which, to the extent to which they are the kind that have preserved life, have become firm - only to this extent is there anything like 'knowledge', ie a measuring of earlier and later errors by one another.' Nietzsche, Will to Power, section 520, quoted in Turner, (1984) p.242.

practices is that language plays a powerful role in moulding the ways in which it is possible to think about the world. In other words, language functions as the medium through which experience is systematised, in which order and 'stability' are imposed on a world of constant 'becoming'. [138] The third significant element of Nietzsche's epistemology is that he regards interests as a necessary condition of knowledge. On the one hand his perspectivalism insists that knowledge is relative to such things as time, location, culture and language, and as such cannot be isolated from the context and relations of its constitution. However, he also understands knowledge (and subjectivity) as more generally serving the interest of the human species in securing the means for the preservation of its own life. Thus Nietzsche argues

> Consciousness does not really belong to man's individual existence but rather to his social or herd nature ... We simply lack any organ for knowledge, for 'truth': we 'know' (or believe or imagine) just as much as may be useful in the interests of the human herd, the species. (Turner, 1984 p.242) [139]

This suggests a view in which knowledge serves a functional role in the evolutionary development or natural history of the human species, which while ultimately based in the biological attributes, is also linked to the 'necessary features' of social communication. (Turner, 1984 p.242-3) [140] The similarity of this view to Habermas' notion of a human technical interest in the mastery of nature and a practical interest in communication is readily apparent, [141] as is the similarity to Horkheimer and Adorno's radicalisation of the link between 'identity thinking', instrumental reason and the domination of nature. In Foucault's case,

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[138] Nietzsche thus argues that the structure of language is in fact what is responsible for notions of causality and subjectivity: 'Where there exists a language affinity it is quite impossible, thanks to the common philosophy of grammar - I mean thanks to unconscious domination and directing by similar grammatical functions - to avoid everything being prepared in advance for a similar evolution and succession of philosophical systems; just as the road seems to be barred to certain other possibilities of world interpretation.' Nietzsche (1989), section 20 p.50; also Turner (1984) p.242.

[139] Nietzsche, The Gay Science, section 354, quoted in Turner (1984) p.242.

[140] Warren points out that 'the conditions of possibility' for knowledge are in part seen by Nietzsche as 'interests relating to human agency', that is, as involving interests in 'the material, social and cultural worlds as means to and conditions of power organised as subjectivity.' Knowledge cannot be extricated from the interest the self has in increasing its 'feeling of power' or will to power. See Warren (1988) p.90-2.

[141] Warren points to Habermas' treatment of interests (as a positive condition of knowledge) as 'a contemporary equivalent' of Nietzsche's approach, 'notwithstanding Habermas' own interpretation of Nietzsche.' (Warren, 1988 p.269 footnote 35). Warren argues that Habermas' interpretation of Nietzsche's theory of power 'misses the mark' due to over-reliance on works such as Untimely Considerations and The Gay Science in which Nietzsche's views on truth and knowledge were not fully developed. See Warren (1988) p.270 footnote 46.

the influence of Nietzsche can clearly be seen in his insistence that the idea of a necessary correlation between the order of discourse and the order of things is a metaphysical assumption of Western philosophy. (Foucault, 1970; 1981d)

Similarly some parallels and overlap between the concern of Weber and Foucault can be discerned.[142] Indeed, Dreyfus and Rabinow suggest that Foucault inherited from Weber 'a concern with rationalisation and objectification as the essential trend ... and most important problem' of modern society. (Dreyfus and Rabinow, 1982 p.166) [143] Smart sees some areas of common concern, such as rationalisation, power and discipline, but also points to important differences between the two. Thus while Weber's notion of rationalisation took the form of a global, all-encompassing process, Foucault's work was concerned with rationality in much more specific and relative sense, and is developed in a way that denied any 'absolute form of rationality against which specific forms might be compared or evaluated.' In contrast to the 'monolithic dimensions' of Weber's thesis, Foucault explicitly rejected understanding rationalisation in terms of any totalising notion of modern society or culture. As a consequence Foucault's analysis, according to Smart, held open the possibility of resistance whereas Weber succumbed to the fatalistic vision of the 'iron cage' of bureaucratic domination and instrumental reason. (Smart, 1983 p.126) [144]

A further area of commonality between Weber and Foucault is that both were also concerned with forms of domination and discipline. However, Weber tended to conceptualise power in terms that emphasised the importance of the state and the intentionality of subjects, and which saw power in a juridical sense as negative and prohibitive. (O'Neill, 1987 p.54-5; Smart, 1983 p.126 p.129) By contrast, Foucault treated power as a far more positive and relational phenomenon, which not only constrains individuals but also is productive of different modes of subjectivity and the social relations possible in any particular historical milieu. (Foucault, 1982 p.219-20) Nevertheless, both placed emphasis on an understanding of rationalisation as the disciplining of the body, the origins of

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[142] Some attempts to deal with this connection include Turner (1984) p.157-176, 226-251; (1987) p.222-241; Gordon (1987) p.293-316; Smart (1983) p.123-137; Lash (1987) p.355-377; O'Neill (1987) p.43-60; Hindess (1987) p.137-153; Clegg (1994); Owen (1994).

[143] As indicated above, Foucault clearly locates his work within the same broad problem as Weber, but is quite insistent that French philosophical thought 'knew absolutely nothing - or only vaguely, only very indirectly - about the current of Weberian thought.' See Foucault (1983) p.200.

[144] Gordon however argues that 'Weber is as innocent as Foucault of the so-called Weberianism that adopts a uniform, monolithic conception of historical phenomena of rationalisation.' See Gordon (1987) p.293-4. Turner suggests that while Smart's characterisation of Weber is justified, it is important to note that Weber did argue against postulating 'general laws of social development', and to that extent Weber's work 'lacked internal consistency'. See Turner (1987) p.232-3.

which are traced to the institutional practices of the monastery and army in medieval Europe. [145] The rational disciplining of the body was characterised by Weber as a process in which the 'natural rhythm' of human beings as biological organisms was brought into 'line with the demands of the work procedure, (and were) attuned to a new rhythm through the functional specialisation of muscles and through the creation of an optimal economy of physical effort.' (Smart, 1983 p.130-1) [146] Such comments bear a striking resemblance to Foucault's description of what he terms biopower or the 'anatomo-politics of the human body'. This new form of power which began to emerge in the seventeenth century, is 'centred on the body as a machine', and involves the disciplining of the body through 'the optimisation of its capacities' so as to produce a 'parallel increase of its usefulness and its docility, its integration into systems of efficient and economic controls.' As with Weber then, Foucault saw this new form of discipline as indispensable to the development of capitalism, which required the 'controlled insertion of bodies into the machinery of production and the adjustment of the phenomena of population to economic processes.' (Foucault, 1990 p. 139-41)[147]

Gordon has suggested a further link in Foucault's later work on governmentality and neo-liberalism with a growing interest in the significance of Weber's influence on recent intellectual history. (Gordon, 1986 p.79; Gordon, 1987 p.295-6) In particular Foucault credited Weber with providing a counter-focus to Marxism. In doing so he directed the attention of social theory to the problem of the 'irrational rationality of capitalist society', that is, to the historical understanding of the present in terms of processes of rationalisation which are 'multiple, specific and potentially discordant.'[148] In particular, Foucault pointed to

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[145] Turner argues that while Weber's main focus is on the changes in knowledge and consciousness brought about by rationalisation and the development of capitalism, this perspective also incorporates a 'general process whereby the body ceases to be a feature of religious culture and is incorporated via medicalisation into a topic within scientific discourse', that is, there is a shift to 'regulation of the body and of populations.' (Turner, 1987 p.224-6) See also Smart (1983) p.129-31; Miller (1987) p.5-9.

[146] See Weber (1968) p.1156.

[147] I discuss the aspect of Foucault's work in relation to the development of modern ecological discourse in Chapter 6. See O'Neill (1987) for a discussion of the rise of industrial discipline and its treatment in the work of Weber, Foucault and Marx. O'Neill argues that industrial discipline tends to 'naturalise bureaucratic controls which are embedded in the social organisation or power structure of the firm', and that the 'bureaucracies of state and economy' seek to depoliticise their power by subordinating this within 'the neutral image of disciplined technology and expertise.' (p.55-7). See also Turner (1984) especially Chapters 7 & 10 and (1987). For a Foucauldian examination of the bureaucratic regulation of industrial bargaining under US labour law, see Moore 1993 p.165-189.

[148] Dews argues that Foucault's characterisation of power as productive of objects and rituals of truth is 'acceptable' when understood within the Weberian tradition's focus on the historical specificity of the transition from traditional to modern society. Thus Dews claims that Foucault's account of power describes 'the productivity and efficiency of those purposive-

a common Weberian heritage in both the Frankfurt School and the neo-liberalism of the Ordoliberalen or Freiburg School (Gordon, 1986 p.79-81) [149] which, while politically opposed, nevertheless also share an emphasis on anti-naturalism, the historical contingency of social forms and a specific concern with the problems of the ethical conduct of life in modern Western society.[150]

Nietzsche and Weber have likewise also been key theoretical influences on Frankfurt School critical theory. Horkheimer and Adorno explicitly acknowledge their debt to Nietzsche in their treatment of the 'dialectic of enlightenment', claiming it was he who first recognised the existence of a nihilistic 'anti-life force' inherent within enlightenment. [151] Their discussion of the domination of nature as a universal feature of 'identity thinking' and instrumental reason draws heavily on Nietzsche's theme that knowledge operates as a tool of the 'will to power', in which the drive to predict and master nature serves the interests of self-preservation. (Held, 1980 p.156-7) Similarly, key aspects of Weber's concept of societal rationalisation were appropriated by Horkheimer and Adorno in their analyses of the domination of reason by instrumental rationality and the rise of a bureaucratised, 'totally administered society.' (Held, 1980 p.65-68)

Habermas too bases central elements of his understanding of societal rationalisation and modernisation on a critical reading of Weber, arguing that Weber's analysis fails to appreciate the 'selectivity', or differentiation, exhibited in the processes of rationalisation. According to Habermas, Weber cannot adequately explain the way in which under conditions of capitalist modernisation, instrumental rationality 'surges beyond the bounds' of the material reproduction of economy and state, distorting the communicative reason necessary to the 'symbolic reproduction of the life-world.' Hence, he argues that it is possible to overcome Weberian pessimism (the 'iron cage') once critical theory understands that the 'colonisation' of life-world by instrumental reason is a pathological distortion of the rationalisation process rather than its inevitable outcome. For Habermas, the progressive potential of modernity can be realised provided critical

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rational forms of organisation which Weber detected in modern bureaucracies and in the capitalist organisation of the labour process. Similarly, Foucault's repeated denial's that power can be considered as a possession of groups or individuals becomes comprehensible in the light of Weber's account of the transition from 'charismatic' and 'traditional' to 'legal-rational' forms of domination.' (Dews, 1987 p.150-52)

[149] Here Gordon draws on then unpublished recordings and transcripts of Foucault's lectures on the history of liberalism and neo-liberalism delivered in March-April 1979. See also Gordon (1987) p.314-5.

[150] Thus, according to Gordon, Foucault points in his 1979 lectures to a 'double destiny of Weberianism in Germany' which 'ends with the street battles of 1968 in which the last disciples of the Frankfurt School confront the police of a government inspired by the teachings of the Freiburg School.' (Gordon, 1986 p.80)

[151] For a review of the influence of Nietzsche on critical theory, see Putz (1981) p.103-114.

theory appreciates the different analytical approaches appropriate to action within the separate social environments of system and life-world. [152] The significance of Nietzsche in Habermas' reconstruction of critical theory is less positive yet arguably still central. In Nietzsche lies the main intellectual impetus behind both the Frankfurt School and Foucault's descent into what Habermas regards as the conservative dead-end of the 'dialectic of enlightenment'. By 'conflating' knowledge with power, Nietzsche provides what Habermas sees as 'the real challenge for the discourse on modernity'. (Habermas, 1985 p.74) [153] On this point rest most of the substantial theoretical differences between Habermas and Foucault discussed in the first part of this chapter.[154]

Since Foucault's death there have been a number of attempts to come to grips not only with the differences between Habermas and Foucault, but also their commonalties. [155] Similarities have also been drawn between the work of the early Frankfurt School and Foucault. Honneth for example, points to several key features of critique common to Adorno and Foucault, although emphasising the divergent philosophical grounds on which these are based. According to Honneth, both Adorno and Foucault understand modernity as a process of technical or instrumental rationalisation that, under the cloak of moral emancipation and progress, violently disciplines a 'pre-rational' dimension of the human body to produce the 'modern, forcefully unified individual'. (Honneth, 1986 p.53-4) Each finds the root of modernity in the intellectual and political changes initiated by the European Enlightenment; each works on the view that knowledge assures domination behind the 'generalisation of theoretical and moral validity claims' and the growth of legal and constitutional structures. In this view, both Adorno and Foucault understand instrumental rationality as expressing a tendency towards the totalitarian control of social life. Modernity, in other words, is characterised by the regulative capacity to 'intervene like total institutions in the life context of every single individual in order to make him a conforming member of society through discipline and control, manipulation and drilling'. This is a view I have argued is not accurate as far as Foucault is concerned. However, in agreement

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[152] The first requires a systems theory while the latter demands a hermeneutic or 'action-theoretic' approach. See Habermas (1981a) p.5-31; (1984) Chapter II, and (1987) Chapter VIII, especially p.303-331.

[153] For Habermas' critique of Nietzsche, see Habermas (1985). For a concise and critical consideration of the significance of Nietzsche in work of Foucault and other post-structuralist writers such as Derrida, Lyotard and Lacan, see Dews (1987).

[154] The connection between knowledge and power is central to the examination of contemporary ecological discourse and programs of environmental regulation discussed in Chapter 6 of this thesis.

[155] Some significant examples of this include Kelly (1994); Miller (1987); Honneth (1991); Dews (1987); Habermas (1985). See also, for example McCarthy (1990) p.437-469; Richters (1988) p.611-643.

with Habermas, Honneth sees Foucault as succumbing to a totalising critique similar to that which deprives Adorno and Horkheimer of a rational basis for their own arguments for a critical social theory. He points to the quite different conceptions of subjectivity that lead to these similarities, while claiming that Foucault's social theory in the end is a 'version of the Dialectic of Enlightenment reduced to systems theory.' (Honneth, 1986 p.56-58) [156]

McCarthy has also drawn out some of the broad affinities, as well as differences, between Foucault and the Frankfurt School, including Habermas. For my purposes, some of these similarities are particularly significant. McCarthy argues that both Foucault and the Frankfurt School assert the 'primacy of the practical over the theoretical' by treating knowledge production as social practice, and requiring that epistemic practices be understood within their broader practical context. Foucault concludes from this the impossibility of knowledge or truth (at least in the human sciences) that is outside of relations of power and hence capable of grounding a theory of the social totality. This is in contrast to the Frankfurt School, which did not give up the attempt to find some form of universalising truth-function for reason in the realisation of social emancipation. (McCarthy, 1990 p.441-2) [157] Following from this Foucault sees a pervasive complicity of human science expertise in modern forms of domination and discipline. McCarthy argues that the Frankfurt School theorists, and in particular Habermas, while critical of the role played by the social sciences and social scientific expertise in societal rationalisation, nevertheless still sought to distinguish between different forms of social inquiry in a way that did not regard them all as extensions of an instrumental rationality directed towards 'ever more effective forms of domination.' (McCarthy, 1990 p.439-40, 442) [158] Despite the differences between the two approaches to social theory, a key feature of each is the use of 'functional accounts of how and why purportedly rational practices came to be taken for granted'. Such accounts are central to critique inasmuch as they problematise and destabilise the apparently natural and necessary character

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[156] Elsewhere Honneth argues the usefulness of Habermas' differentiation of spheres of social action (symbolic and material) in undermined by the move in Theory of Communicative Action to a systems theory approach dominated by a technocratically conceived understanding of two fundamentally different modes of action-coordination. Thus Honneth claims, despite criticism of Horkheimer and Adorno, Habermas fails to extricate his own theoretical project from the technocratic diagnosis of modernity laid out in Dialectic of Enlightenment. See Honneth (1991); Smith (1993).

[157] I argue in the Chapter 7 of the current thesis that Foucault makes a dubious distinction between the human and natural sciences when he suggests that the latter has been able to detach itself from the social contexts of power in which it originated.

[158] McCarthy is not suggesting that Foucault lacked a notion of social critique. See McCarthy's (1990) discussion of this (p.451-2). As I discuss in Chapter 7, the basis on which Foucault could argue that *any form* of scientific knowledge is not implicated in power raises significant theoretical questions.

of social and epistemic practices by demonstrating how these are in fact the product of 'contingent relations of force and an arbitrary closing off of alternatives'. (McCarthy, 1990 p.439-40)

However much these common concerns with the role of rationalisation as a fundamental characteristic of modernity provide Habermas and Foucault with a similar object of inquiry, there remain significant differences between the two. A detailed exploration of these differences is an important philosophical task that is both beyond the scope of this current work and is undertaken elsewhere by others.[159] Here, my focus has been on the differences between the two as it is most directly relevant to the problem of nature.

Conclusion

The debate between Foucault and Habermas on rationality and power, and their relation to knowledge, is *the* key area of disagreement between the two. It is in any case the point on which I have focused as this debate leads directly into Foucault's notions of biopower and governmentality. It is these concepts which I argue provide a particularly useful antidote to Habermas' unsatisfactory theoretical approach to understanding ecological problems in particular, and more generally to his adherence to what Smith (1993, p.107) has described as the 'theoretical fictions' of norm-free organisation of action and power-free paths of communication. Appreciation of the reciprocal relation between juridical power and biopower, discussed in the early part of this chapter, is indispensable to any analysis of the regulatory *biopolitics* of the population, and particularly for understanding the growth of ecological regulation with its dependence on scientific knowledge.

Habermas' system-lifeworld scheme, despite hints of potential usefulness (ie its focus on questions of social reproduction), obscures the need for historical-empirical investigation by its very generality and abstractness. His formulation leads to a rigid separation of power and discourse, a problem directly linked to a juridical schematism in his understanding of power. He arbitrarily restricts the domain of power to the social 'system' (administration and economy), recognising the operation of power within the 'lifeworld' only as a pathological state resulting from 'colonisation' by the system. This is a theoretical consequence of his conceptualisation of the lifeworld as the *power-free* realm of communicative action, which he sees as furnishing the ontological and transcendental preconditions for all sociality and rationality. By persisting with the theoretical fiction of power free discourse, Habermas falls into an empty

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[159] See in particular Miller (1987), Honneth (1991), Hindess (1996).

proceduralism and fails in his self appointed task of establishing the possibility of a universal grounding for validity and truth claims.

In the next chapter I turn specifically to a consideration of Foucault's work on biopolitics and governmentality. In particular I consider the potential of these concepts to provide a useful theoretical framework from which to understand the development of scientific ecology as an important element of contemporary attempts to regulate the behaviour of the human population.

Chapter 6

Biopolitics, governmentality and scientific expertise

Introduction

This chapter considers in more detail aspects of Foucault's work on biopolitics and government.[160] It starts by tracing the development of the theme of disciplinary power through to biopolitics in Foucault's work and his shift from a focus on the individual and the 'micro-physics of power', to a more global concern with the management of populations. The link between the development of this notion of biopolitics and the work on governmental rationality is explored. The chapter considers the work of authors such as Nikolas Rose and Peter Miller, who tie governmentality to an analysis of the role of expertise in advanced liberal societies. This discussion prepares the way for a critical consideration in Chapters 7 and 8 of Foucault's treatment of the natural sciences, and subsequently, an evaluation of the notions of ecological modernisation and risk society in the final chapter.

Discipline and biopolitics

The previous chapter argued that Habermas' criticisms of Foucault failed to adequately appreciate the interrelationship between juridical power and disciplinary power. That chapter concluded with the suggestion that an understanding of this is indispensable to an analysis of the biopolitics of populations and the growth in ecological regulation. It is now necessary to trace the connection between discipline and biopolitics as a precursor to examining Foucault's notion of governmental rationality (or *governmentality*).

In Discipline and Punish, Foucault examined in detail the emergence of a new form of power, a disciplinary 'technology' that directly acts upon the body of the individual. Disciplinary power does not completely displace other forms of power, but instead 'invests' these with a new capacity to penetrate the most minute, everyday activities of individuals. This disciplinary power has the effect of producing docile bodies 'that may be subjected, used, transformed and improved.' (Foucault, 1979b p.136) The emergence of disciplinary power, according to Foucault, was directly related to the growth of capitalism in Europe:

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[160] A version of this chapter has previously appeared as Rutherford (1999b)

> it is largely as a force of production that the body is invested with relations of power and domination; but, on the other hand, its constitution as labour power is possible only if it is caught up in a system of subjection ... the body becomes a useful force only if it is both a productive body and a subjected body. (Foucault, 1979b p.25-6)

The development of capitalism, the economic modernisation of Europe, was reciprocally tied to the emergence of disciplinary power. Indeed Foucault suggested that the spread of these new disciplinary techniques preceded the growth of capitalism. The investing of social relations with these new 'micro' relations of power while not a cause of capitalist modernisation were very much 'the prerequisite for its success'. (Foucault, 1990 p.140-1; Rabinow, 1984b p.18) [161]

The focus of Discipline and Punish was on understanding disciplinary technologies as based on a form of power that operates in the 'minute, capillary relations of domination' that form the ongoing substratum for the institutions and structures of the state. (Gordon, 1980a p.255) This 'microphysics of power' suggested that the actual operation of power relations could only be grasped through analysis of the disciplinary techniques that produced docile bodies within specific institutional contexts, such as the prison, the school or the workplace. A key criticism that arose regarding Foucault's work of this period was that emphasis on such local relations of power ignored the 'macro' issue of the relationships between particular institutions ('society') and the state. Foucault's work on governmental rationality provided a direct and important response to this type of criticism.[162] By 1976 Foucault had turned his attention to a consideration of the connection between the operation of power at the micro level of the individual within particular institutional situations, and the problem of the regulation at a global or macro level of entire populations by the state. (Foucault, 1990) [163]

The context in which Foucault developed this connection was his description of the emergence, in the eighteenth and nineteenth centuries, of a new form of political power concerned with the 'task of administering life' (Foucault, 1990 p.139). This modern form of power, which he called biopower, focused on the fostering of life and the care of populations. He described biopower as developing

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[161] This argument is not dissimilar to that of Weber.

[162] Gordon notes that Foucault introduced his governmentality lectures at the College du France as being, in part, an answer to this criticism. See Gordon (1991) p.4.

[163] See also Dean (1994) p.175-6 and Gordon (1991) p.4-5. This is also a key issue addressed by actor network theory, which I discuss in detail in Chapter 8. For a particularly insightful and useful discussion of the relationship between micro-relations of power and macro-social structure, see Callon and Latour (1981).

in two distinct yet related forms. The first of these, constituting 'an anatomo-politics of the human body', focuses on disciplining the body of the individual to increase its utility and manageability through its 'integration into systems of efficient and economic controls'. This element of biopower is generally equivalent to the notion of disciplinary power developed by Foucault in Discipline and Punish. The second, and more recent form of biopower, focuses on the supervision of what Foucault called 'the species body', that is, 'the body imbued with the mechanics of life and serving as the basis of the biological processes'. Management of the species body occurs through a range of 'interventions and *regulatory* controls' Foucault characterised as '*a biopolitics of the population*.' (Foucault, 1990 p.139)

Foucault identified a range of empirical investigations, particularly in demography and geography, which were closely connected to the rise of these regulatory interventions. In general he argued that the social sciences developed to meet particular demands of the administration of human populations, resources and the economic relations between them. (Foucault, 1980b p.171-2; 1991c p.93) In these developments, *population* emerged as an economic and political problem in which the central concern is the proper balance between population growth and available resources. (Foucault, 1990 p.25) While Foucault does not do so explicitly, it is worth noting that in this process, not only does the idea of a measurable and manageable population come into existence, so also does the notion of the environment as the sum of the physical resources on which the population depends. According to Foucault, in the eighteenth century population and environment come to be seen as constituting 'perfect living interrelation', with the task of the state involving the supervision of the 'living interrelations between those two types of living beings' (population and environment). (Foucault, 1988b p.160) [164] The elaboration of this 'population-riches problem' occurred within a network of new types of knowledge and techniques of government, having as their primary concern programs for the statistical description and the efficient management and disposition of all elements of the population and its resources. (Foucault, 1991c p.93; 1981a p.238; 1988b p.104)

Through this problematisation of the population, the term *economy* came in the eighteenth century to signify an entirely new reality and a field of governmental intervention. (Foucault, 1991c p.92) Foucault suggested that population constituted a new realm of intervention in three respects. First, the emergence of the population as a distinct and measurable reality was connected to an understanding that 'population has specific economic effects: statistics, by

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[164] Here Foucault is referring to the work of police theorists, particularly von Justi, who appropriated to political-administrative thought the new demographic knowledge. Here, as elsewhere, Foucault appears to refer to the 'environment' as the totality of natural resources and physical living conditions of human populations.

making it possible to quantify these specific phenomena of population, also shows that this specificity is irreducible to the dimension of the family.' These specific phenomena included such things as 'epidemics, endemic levels of mortality, ascending spirals of labour and wealth' etc. Second, in the 18th century the welfare of the population, that is, improving living conditions, health, longevity, increasing wealth, etc, increasingly came to be regarded as an ultimate end of government. In the process, the idea of the population itself as the subject of needs and interests came to the fore. Population thus became 'an object in the hands of government', acted upon and manipulated through a range of new governmental programs and techniques aimed at managing those demographic factors relevant to welfare and security. Third, population became the focus for political economy, the 'new science of government' which was inextricably related to 'a knowledge of all the processes related to population in its larger sense: ... what we now call the economy.' Thus government at this time increasingly came to be based on a model of the 'continuous and multiple relations between population, territory and wealth'. This required new modes of intervention in the domains of population and economy, and was aimed at protecting and enhancing the interests of the population, and through this the state. (Foucault, 1991c p.99-101)

As noted above, Foucault regarded biopower as 'indispensable' to the development of capitalism. He pointed to the parallel growth of the *institutions* of state power alongside the *techniques* of biopower (both disciplinary anatomo-politics and biopolitics) within the economy and population. It is through the operation of biopower 'at every level of the social body', across a diverse range of social locations (including schools, clinics, the family, the military and administration) that the modern capitalist economy became possible and was sustained. The techniques of biopower also played a pivotal role in processes of social segregation and hierarchisation. These not only guaranteed that the political relations of domination and hegemony of the modern state were efficiently perpetuated, but also ensured a congruence between the 'accumulation of men to that of capital, the joining of the growth of human groups to the expansion of productive forces.' (Foucault, 1990 p.140-1)

Foucault identified several other key factors as arising from the formation of this new domain of political action focused on human beings as living entities. One was what he described as the eighteenth century 'rupture' in the way in which scientific discourse dealt with the 'twofold problematic of life and man'. By this Foucault meant the emergence of the modern view of human beings, which was based on a new view of the relationship between history and life. Human life was seen as having a 'dual position' that is simultaneously 'outside history, in its biological environment, and inside human historicity, penetrated by

the latter's techniques of knowledge and power.' [165] (Foucault, 1990 p.143) This dual problematic itself can be understood, in large part, as arising from the fundamental shift that occurred towards the end of the eighteenth century, in the way in which life in general was conceptualised. The transformation was associated, according to Foucault's account, with a general discontinuity between the 'classical' and the 'modern' era, and in particular with the development of modern biology. Unlike classical natural history, modern biology saw life as dependent for its existence on the way in which organisms are functionally linked to their external surroundings, that is on the way in which they *exchange resources with their environment*. The classical view of a timeless continuity of nature was replaced by a concept of life in which species were understood as discontinuous entities shaped by the evolutionary influence of environment, and therefore 'tied to the time in which these forces and their effects exist.' (Gutting, 1989 p.192) [166]

Another key outcome of the growth of modern biopower was the increasing importance of what Foucault described as the 'action of the norm', at the expense of sovereign power and the law. (Foucault, 1990 p.144) There are several key elements to this argument. As outlined in Chapter 5, there was a decline in the absolute power of the sovereign over his subjects, and a shift to reliance on a series of expert knowledges that endowed the subject with a multiplicity of properties denoting such things as sexuality, criminality, states of physical, mental and moral health etc. In concert with this, there developed a series of specific disciplinary technologies that operated corporeally to train the body, increasing its economic utility and political docility. (Foucault, 1979b p.128-44) The experts involved in the production of these new discourses also acted as the technicians and 'normative judges' responsible for the application of such disciplinary and corrective programs. Affecting such detailed, individualised supervision was beyond the blunt, prohibitive capacities of the judicial system. Rather Foucault argued that what had come into existence was a subtle, individualising mode of power that was able to 'take charge of life' and distribute the living, biological subject as efficiently as possible within the social and economic field. Such a task required 'continuous regulatory and corrective mechanisms' with the power to 'quantify, measure, appraise and hierachise' so as to effect a distribution about the norm. (Foucault, 1990 p.144)

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[165] I argue in Chapter 7 that while Foucault's treatment of power takes the significant step of identifying this 'dual position', it also unfortunately tends to perpetuates this in some respects by failing to rigorously subject the biological environment itself to scrutiny. The 'biological environment' is itself an historical product and not a mere 'substrate of life' that lies outside the relations of power, especially those of the natural sciences which Foucault tended to neglect.

[166] See Foucault (1970) p.125-62, 263-79, and (1979a) p.125-30.

As I emphasised in the previous chapter, Foucault did not see biopower as replacing juridical power but rather saw it functioning in conjunction with it, so that the law increasingly tended to function as a norm rather than as a rigid prohibition. The legal system was more and more 'incorporated into a continuum of apparatuses (medical, administrative, and so on) whose functions are for the most part regulatory'. (Foucault, 1990 p.144) It was this displacement of sovereign power and the incorporation of the juridical as a correlative to the effectivity of the norm that distinguished biopower. (Hewitt, 1983 p.69) It was the conjunction of the modern biological understanding of 'life' and the proliferation of medical and social scientific knowledge as normalising disciplines that brought forth a qualitatively different and distinctively modern *biopolitics*. For Foucault, the rise of biopower, from the eighteenth century onwards, represented quite literally the 'entry of life into history'. (Foucault, 1990 p.141) In saying this Foucault was not denying that the age-old problem of the biological struggle for existence, as manifested in the threat of famine and epidemic, could exert a political effect on history. Such influences were clearly not new. Rather he was arguing that with economic development and increased productivity during the eighteenth century it became possible to gain some control over the threat of death at this basic biological-demographic level.

Foucault's comments on why this occurred were in most regards quite in line with traditional accounts of modernisation. He argued that increases in agricultural productivity and availability of resources in eighteenth century Europe encouraged rapid demographic growth and accompanied greater security from starvation and disease. Essential to this was the development of new areas of knowledge, particularly in biology, agriculture, and public health. (Foucault, 1980b p.168-72; Foucault, 1990 p.142) It is against the background of these transformations that Foucault identified the emergence of the discourses on population and security. He was able to claim that life entered history precisely because these new technical and normative disciplines provided a relative control over the actual conditions of life. In doing so they took upon themselves responsibility for the control and modification of 'the life processes'. In the modern West, knowledge of the biological conditions of life and their relationship to individual and collective welfare thus came to be reflected upon as *political* concerns, and no longer as 'an inaccessible substrate' that only emerged periodically against the randomness of fate and death. (Foucault, 1990 p.142) Political power was no longer primarily sovereign power exercised over legal subjects (over whom the ultimate authority was death) but was concerned with the management of living beings and their relations with all the factors that shaped security and welfare. The influence biopower exercised over living beings was necessarily 'applied at the level of life itself', and in so operating, biopower simultaneously gained influence over the individual both politically and as a biological entity. The corporeal nature of the body of the subject was brought directly into the explicit calculations of power and was thereby transformed into a

subjected body. The body (individually and collectively) became both the raw material of power and at the same time that which produces and transforms itself as a living being. (Foucault, 1990 p.142-3; Hewitt, 1983 p.69)

Foucault explicitly discounted the suggestion that biopower resulted in the total integration of all aspects of life into the techniques that administer it, [167] indeed, he asserted that life 'constantly escapes them'. (Foucault, 1990 p.143) [168] Nevertheless, with the increasing penetration of biopower's normalising reach into new areas of life activity, and hence the emergence of life as a *political* object, a new conception of rights developed. However, according to Foucault, this was a form of rights radically different from the traditional right of sovereignty and was incomprehensible from within the framework of the classical juridical system. It was in fact a notion of 'rights' that, while couched in the traditional terminology of rights and law, was 'turned back' against that traditional system. Thus the politicisation of life, directed as it was at the satisfaction of essentially *biological* needs (including the psychological) gave rise to a recognisably modern interpretation of rights. Foucault described this as 'the "right" to life, to one's body, to health, to happiness, to the satisfaction of needs, and beyond all the oppressions or "alienations", the "right" to discover what one is and all that one can be'. (Foucault, 1990 p.145) It is within this context that the 'right to life' of the modern subject came into being and within which its actions must be understood.

Biopolitics and ecological risk

Some of Foucault's remarks suggest continuity between this modern right to life and the contemporary concern about risks to the environment. He claimed that the 'biological risks' confronting the human species now 'are perhaps greater and certainly more serious, than before the birth of microbiology.' (Foucault, 1990 p.143) He further suggested that the economic and social conditions that from the eighteenth century allowed the West a measure of relief from the struggle against famine etc do not necessarily apply 'outside the Western world'. He then went on to link the notion of *modernity* directly to biopower and the conditions under which it emerged.

> But what might be called a society's 'threshold of modernity' has been reached when the life of the species is wagered on its own political strategies. For millennia, man remained what he was for Aristotle: a living animal with the additional capacity for a political existence;

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[167] This is an argument mounted against Foucault by Habermas and Honneth. See Chapter 5 of the current thesis.

[168] See also Butler (1989) on this.

> *modern man is an animal whose politics places his existence as a living being in question*. (Foucault, 1990 p.143 - emphasis added) [169]

These comments suggest that Foucault's work on biopolitics is capable of addressing the notion of ecological risk and the problem of the social relation to nature, which have emerged as central problems for contemporary social theory. As discussed in Chapter 4, Ulrich Beck and Klaus Eder both regard ecological threats as the systemic result of global processes of modernisation and rationalisation, which have created *new ecological fields of conflict* within contemporary society. Foucault's understanding of modernity as involving the emergence of biology as an object of political calculation and control indicates that the sorts of biological concerns he dealt with are not fundamentally dissimilar from those more specifically ecological ones focused on by Beck and Eder.

Beck for example draws a clear link between the success of economic growth and the consolidation of welfare state mechanisms in providing an unprecedented level of security for life. The development of such productive capacities is, at the same time, seen as creating an entirely new class of technologically induced risks which have the potential for the ecological 'self-endangerment' of human society and life in general. This is tied to what Beck describes as the sub-politics of risk society, in which power operates largely outside the formal institutions of government, resulting in a breakdown of the notion of a political centre capable of controlling the processes of scientific-economic development. At the same time, and despite this lack of a political centre, there has been a proliferation in knowledge-based programs of risk creation, monitoring and intervention in the most detailed levels of industrial management, by both state and non-state actors. [170] Beck's work suggests that these processes are a defining feature of late modernity and are quite different from the traditional distributional conflicts characteristic of the era of primary industrialisation, which he places as coming to a close by the early 1970s. (Beck, 1992b p.20-22)

There is a clear similarity in this line of argument with the distinction Foucault drew between the 'old' environmental risks such as famine, and those 'modern' ones that result when the life of the human species is wagered 'on its own political strategies'. However, Foucault's account of the emergence of biopower in the eighteenth century casts doubt on Beck's insistence that the 'risk society' is a fundamentally new type of society or even a very recent development. It may be that the sorts of social processes Beck focuses on, particularly the relationship between technical capacity, expert knowledge and the distribution of risks (and power) are not so much a fundamentally new

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[169] Foucault's use of the term 'modernity' in other works is somewhat different. See Foucault, (1991e).

[170] See the discussion of Beck and Eder in Chapter 4 of this thesis.

phenomenon but simply a recent articulation of the biopolitics Foucault described in another context. I give further consideration to the relationship between Foucault and the work of Beck and Eder in the final chapter. For the present let us return to the consideration of Foucault's notion of biopower, before examining its connection to his work on governmental rationality.

One useful way of understanding Foucault's notion of biopower is to follow Bryan Turner (1984 p.159), who argues that, notwithstanding his apparent hostility to systematic theorising, Foucault's work implicitly embraces a particular causal explanation of the modern world. Turner identifies the 'unifying theme' of Foucault's work as a dual focus on the '*rationalisation of the body* and the *rationalisation of populations* by new combinations of power and knowledge'. He argues that these rationalisations are the effect of increasing population densities, which in the nineteenth century came to threaten 'the political order of society'. (Turner, 1984 p.163- emphasis added) Turner rightly emphasises the role population pressures played in Foucault's analysis of the development of biopower, [171] pointing out that

> it is this factor which stands behind the expansion and development of new regimes and regimens of control - a profusion of taxonomies, tables, examinations, drills, dressage, chrestomathies, surveys, samples and censuses. The pressure of men in urban space necessitates a new institutional order of prisons, asylums, clinics, factories and schools in which accumulated bodies can be made serviceable and safe. Just as the space of knowledge experiences accumulations of new discourses, so the social space is littered with bodies and the institutions which are designed to control them. (Turner, 1984 p.160-1)

If this view is developed, not only is knowledge pivotal to practices of power, but it is also central to the very constitution of the objects of upon which biopower operates, that is, to the 'making-up' of *both* people and *things*. Biopolitics therefore is inherently linked to the development and elaboration of specific forms of expertise. This is a theme I consider in more detail later in this chapter. For the present, it sufficient to emphasise that *the definition and administration of populations simultaneously requires the constitution and management of the environment in which those populations exist* and upon which they depend. Such a conclusion is implicit in Foucault's approach although not developed. As a consequence Foucault does not adequately deal with the way in which the political and economic problematisation of populations also gave rise, at a more recent time, to a similar problematisation of nature and the environment. Notwithstanding my suggestion above that Foucault hints at continuity between

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[171] Direct confirmation that this is Foucault's approach can be seen in Foucault (1990) p.142 and Foucault (1980b) p.171-2.

biopower and ecological risk, I develop a critique of Foucault's approach to the natural sciences in Chapters 7 and 8. [172] Nevertheless, it is clear from Foucault's discussions of the biopolitical regulation of populations that this assumes not only the disciplining of individuals and populations, but also, necessarily, a concern with the administration of 'all the conditions of life' as represented by the environment.

For Foucault, biopolitics as the task of administering life at the level of the 'species body', comes into existence at the multiple points of application to the body (both individually and collectively) of disciplines such as public health, medicine, demography, education, social welfare, etc. (Barret-Kriegal, 1992 p.194) Ecology and environmental management can also be regarded as expressions of biopolitics, as these originate in, and operate upon, the same basic concerns for managing the 'continuous and multiple relations' between the population, its resources and the environment. Contemporary ecological discourse, in other words, is an articulation of what Foucault calls the 'population-riches problem'. This suggests a specifically ecological or environmental dimension to biopolitics, which makes more complex the way in which we understand the 'body' as the target and site of power. Not only are we forced to deal with the individual 'anatomical' body and the social body, and the relations between these, but we must also take into account an ecological relationship in which the focus is on the relationship between the social body and the biological *species body*. [173] This is not to suggest that there will not be new forms of discipline and normality directed at the body at the individual level (indeed these would appear to be a necessary component in ecological governmentality) [174].

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[172] See also Rouse (1993) p.137-62; (1987) Chapter 7; and Rutherford (1994a)

[173] The term 'social body' can be regarded as a metaphor for 'the collective embodiment of the targets of power, the body as 'species', whether in the form of an entire population or a specific group of prisoners, school children, the insane and so forth, who are subject to specific types of administration and regulation.' (Hewitt, 1983 p.71) Foucault however says that the term is not simply a metaphor: it refers to a materiality. The police 'take charge of the physical element of the social body'; the object of the police is first and foremost the complete regulation or 'whole management' of the 'complex and multiple materiality' of the social body, the species body. The police is both an 'institutional grouping', that is, a specific set of social apparatuses and administrative structures, and a 'modality of intervention', [Foucault et al, quoted in Barret-Kriegal (1992)] that is, a generalised type of political technology, a 'diagram' or 'schema', 'panopticism'. For a discussion of Foucault's 'ambiguous' use of these two aspects of his notion of biopower, see Donnelly (1992) p.199-203.

[174] For a discussion of how environmental education and environmental drills are combined, in the case of the Canadian Green Plan, to instil new ecological disciplinary practices in the daily lives of individuals, see Darier (1995) and also Bowerbank (1999). An anecdotal tale from the author's own experience can perhaps succinctly demonstrate such environmental disciplinary practices. In the early 1990s certain state government jurisdictions in Australia became concerned by the cancer risks of increased exposure of young school children to ultra violet radiation resulting from atmospheric ozone depletion in the Southern Hemisphere. The school authorities introduced rules requiring children to where sun hats outside during play breaks.

However, as with areas of social policy such as public health, the ecological is primarily biopolitical in nature, that is, it is manifested in specific regulatory controls aimed at the population, albeit from a somewhat different perspective.

Governmental rationality

Foucault's work on biopolitics, especially the first volume of The History of Sexuality represented a development that went beyond his earlier writings on the relation between knowledge and power. As Mitchell Dean argues, the last chapter of The History of Sexuality (Vol 1) in particular foreshadowed a new concern with the problem of government and the role of the state that Foucault took up during the period 1978-84. This was the main work in which Foucault considered in some detail the relation between the 'institutionalised micro-forms of work upon the self ... and the global strategies of the government of the state.' (Dean, 1994 p.175) Whereas Foucault's earlier work had focused on power in terms of a local *microphysics* of power, this later work recasts the problem of power at a much broader, macro-level of analysis. This is not to suggest that Foucault abandoned his strong emphasis on the importance of the micro-level origin and application of power. Rather that the problem was reformulated in a more complex and sophisticated manner, in which the analysis of the state, and government in its broader sense, was not reliant on a juxtaposition of the micro and macro levels of power.

Despite the change in focus that occurs in the writings on biopolitics, and more fully in those on governmental rationality, these later works nevertheless maintain two key concerns developed in his earlier writings. These are, first, continuity between the earlier concern to elaborate a microphysics of power (the disciplinary technologies of the body) and the sorts of biopolitical problems raised by the regulation of entire populations and societies. Second, there is continuity between both of these concerns and the practice of ethics as a form of 'government of the self'. (Dean, 1994 p.176) Foucault's work on government thus takes as its object of analysis, to use Dean's phrase, the 'triple domain' of government. That is, its is concerned with understanding the multiple means by which human conduct is governed through various practices of individual self-

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Children who forgot their hats were restricted to areas of the school grounds where tree cover provided shading. Here we have a very specific (and simple) regulation of the spatial distribution of human individuals as *biological entities* based on a series of quite 'abstract' scientific knowledges and risk assessments, which included (1) radiation exposure dose predictions based on the chemistry of CFC derived chlorine in the stratosphere and its relationship to increased penetration into the lower atmosphere of several wavelengths of ultra violet radiation; (2) epidemiological projections of the likely rate of melanoma cancers in the population in 20 to 40 years later resulting from childhood exposure to sunburn; and (3) the unknown level of risk to specific individuals given the statistical nature of hazard probabilities at the population level.

government, the government of others, and the government of the state. Foucault's characterisation of government as 'the conduct of conduct' (Burchell, 1996 p.19; Foucault, 1982 p.220-1) delineates the field of government in a very broad sense. It is a 'massive domain' that extends from the minutiae of individual self-reflection to the depersonalised, anonymous rationalities concerned with the political regulation of states, populations and societies. (Dean, 1994 p.176-7)

Foucault's development of this notion of government was based on a reconstruction of the principle forms, or 'economies' of power in the West that contributed to the formation of the 'governmental' state. Key to this was the development of new political relations (at the end of the sixteenth and during the first half of the seventeenth centuries) that arose out of a discourse concerning the art, or technique, of governing. This political discourse specifically centred on the state as being its own end and having its own logic and nature, expressed in the theory of *raison d'etat*. According to Foucault reason of state formed out of two political technologies that lead to the formation of the modern nation-state. These were the diplomatic-military practices that developed the external capacities of states through the system of military alliances (leading to the Treaty of Westphalia), and a political technology internal to the state known as the *police*, which attended to the development of all 'the means necessary to increase the forces of the state from within'. These two political technologies came together in the system of mercantilism or cameralism to give rise to the formation of the modern state. (Foucault, 1988b p.103-4)

It was particularly in the development of the police that we see the beginnings of the modern political rationality that enables the formation of biopower. Gordon suggests that the term 'police ' ('the science of police' or *Polizeiwissenschaften*) as used by Foucault is most closely rendered in English as *policy*. (Gordon, 1991 p.10-11) It is particularly in the German and French development of the notion of 'the police' (or policy science) that Foucault says we see the beginnings of the modern political and governmental rationalities that his notion of biopower aims to analyse.[175] This new 'police state' (or policy state), unlike previous forms of rule, did not operate primarily on the basis of the juridical principles of sovereignty and territory. Until the end of the sixteenth century the juridical foundation of sovereignty and the state was territory and the subjects that inhabited it, so that, said Foucault, sovereignty was 'not exercised on things'. Police theorists however replaced the emphasis on maintaining the principality (territory) with a concern for the science of police, or art of government. Central to this new perspective was a definition of government that no longer focused primarily on the governing of territory but rather on the governing of *things*. In Foucault's words, for the exponents of police science

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[175] See Rabinow (1984b) p.16 and Foucault (1991c; 1988b)

> what government has to do with is not territory but rather a complex composed of men and things. The things with which this sense of government is concerned are in fact men, but men in their relations, their links, their imbrications with those other things which are wealth, resources, means of subsistence, the territory with its specific qualities, climate, irrigation, fertility, etc; men in their relations to that other kind of things, customs, habits, ways of acting and thinking etc; lastly, men in their relations to that other kind of things, accidents and misfortunes such as famine, epidemics, death, etc. (Foucault, 1991c p.93)

There was thus a movement away from emphasis on the negative tasks of politics, understood as force, as the task of resisting external opponents and enforcing internal law and order which was characteristic of the sovereign form of power. Instead the principal concern of the state increasingly became the productive tasks of the police, involving a continuous and remarkably specific series of 'positive interventions in the behaviour of individuals' and groups. (Foucault, 1991c p.93) These new police doctrines of government represented a radical shift from the largely negative emphasis on the 'holding out' of sovereign power within a territory, to the emphasis on the positive, detailed management of the entire *social body*, and, to ensuring the abundance and prosperity of the population.

Similarly, the doctrine of reason of state, in holding that the principles of government were inherent to the state rather than deriving from natural or divine law, posed the problem of determining the needs or interests of the state and acquiring the knowledge and information necessary to realise those interests. The task of administration rested above all else on the detailed knowledge of the 'complex and multiple materiality' of all those *things* upon which the state's strength and wealth depended. Thus the task of administration, of the police, rests above all on the gathering of detailed information on all matters relating to the resources and needs of the state. The term *statistics*, noted Foucault, meant precisely 'the science of the state', involving detailed and precise empirical 'knowledge of the state in all its elements' and particularly as these dealt with such things as geography, demography, natural resources, agriculture, climate etc. In this was to be found the main feature of the conduct of reason of state and the science of police, or policy. In order to efficiently arrange *things* in the best interests of the state (that is, for 'convenient ends'), it was necessary to aspire towards an ever more detailed knowledge of the resources of the state, including all the characteristics of its population. (Foucault, 1991c p.93-6)

What emerges most clearly in Foucault's analysis of police science as a specifically modern form of governmental reason is the dependence of government, in all its forms (ethical and political) on a detailed, pragmatic knowledge of that 'complex composed of men and things'. That is, knowledge of populations, resources and those factors which affect their productivity. The

strength of the state, in police theory, was directly linked to the well being of the population. The power of the state is increased inasmuch as the physical (and social) condition of the population is *secured*, made productive and improved. Foucault identified in his examination of the work of the French and German police theorists (particularly von Justi), the clearest definition of the aim of the modern art of government. That aim was 'to develop those elements constitutive of individuals' lives in such a way that their development also fosters that of the strength of the state.' Hence, the police state's concern to acquire the most exhaustively detailed knowledge of, and on the basis of that to intervene in, the activities of each of its citizens assumes a pastoral, even totalitarian, dimension. (Foucault, 1981c p. 245-8, 252) At the same time, and because of this, the police state is also the 'state of prosperity'. (Gordon, 1991 p.10) This should not be seen as support for those, such as Habermas and Honneth, who see in such a statement evidence of Foucault's alleged view of modernity as a totally administered society. What is missed by such an assertion is the genealogical lineage pointed to by Foucault's analysis. Reason of state and police are elements that, while they contribute to the modern governmental rationality, do not fully define it. The police quest for 'total' knowledge was to prove unrealisable in practice. Indeed, if we are to fully understand Foucault's account of how disciplinary biopower and modern state rationality (exemplified in reason of state and police) are brought into play it is also necessary to take into account the influence of liberalism.

Liberalism

Foucault's analysis suggested the modern art of government is derived from two distinct yet related sources - first, the Cameralist/police science influence with its emphasis on a pragmatic knowledge of the state's capacity and resources, and second, liberalism. As I have suggested, police science harboured within it an aspiration to a perfect or total knowledge of the workings of all the state's resources and population. Such knowledge, it was thought, was necessary if the development of the state was to be regulated so as to maximise the realisation of its own ends (security, prosperity etc) in the most efficient manner. Thus police science, as a governmental rationality premised upon the principle of reason of state, always operated on the presumption of their being 'too little government'. (Foucault, 1981b p.354)

Liberalism on the other hand emerges as a *critique of state reason*. (Gordon, 1991 p.15) Liberalism is frequently understood primarily as a political (and economic) theory or ideology concerned with the defence of individual liberty from encroachment by the state. However Foucault's approach was to view liberalism as a specific practice of government that embodies a continuous reflection on not only the limits of government but also its *necessity*. (Foucault, 1981b p.354-6) Where liberalism differs from reason of state is that the state is no

longer considered as its own end, and neither is government considered to be synonymous with the state. Thus Foucault argued

> Liberalism, then, is to be analysed as a principle and method of rationalising the exercise of government ... the liberal rationalisation finds its point of departure in the idea that government would not be considered its own end. Here, *government is not to be understood as an institution but, rather, as an activity which consists in directing human conduct within the setting and with the instruments of state.* ... Phrased differently, this latter question asked what makes it necessary for there to be a government and what objectives ought it to pursue with regard to society in order to justify its existence. (Foucault, 1981b p.354-5: emphasis added)

As with police science and reason of state, the concern of liberalism was (and is) how to achieve maximal efficiency of rule, but of a different sort. The interests of the population can no longer be understood as necessarily coextensive with those of the state. Liberalism is still concerned with governing, that is, with how human conduct can be *directed* to appropriate ends. Where liberalism differs, as a mode of governmental rationality, is that it specifically considers what governmental tasks can be efficiently (and legitimately) conducted by the state and what ambitions must of necessity be regarded as outside of state competence in order to efficiently achieve what does lie within its power. (Foucault, 1981b p.356; Gordon, 1991 p.15)

As a critique of state reason, liberalism called into question the immediate unity of knowledge and government assumed by police science. The liberal critique, developed by theorists such as Adam Smith and Adam Ferguson, pointed to the impossibility, in the economic sphere, of possessing knowledge of the interests and preferences of individuals such that government could direct and regulate private economic activities for the public good. Foucault noted that this should also to be seen as a problem posed by liberalism for government *in general*. The state, according to liberal theorists, cannot in fact posses the sorts of totalising knowledge upon which police science sought to base state action. The opacity, the unknowability, of economic processes precluded the possibility of an economic sovereignty assumed by reason of state. Thus the familiar liberal assertion that the state's ability to act (beneficially) is restricted by the inherently fallible and limited scope of its knowledge. [176]

One result of the influence of liberal thought was to initiate a new relation between knowledge and government in which political economy assumed a greater autonomy and distance from pragmatic state needs than its Cameralist

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[176] For discussion of Foucault's analysis of liberalism see Burchell (1991) and Gordon (1991).

forms. Political economy was seen as a form of knowledge that was central to state functioning, but it could not deliver the sorts of detailed state planning envisaged by police science (or the later Leninist appropriation of this same dream). Political economy therefore assumed, said Foucault, 'the role of a knowledge which is 'lateral to' or 'in *tete-a-tete* with' the art of governing: it cannot however, in itself constitute that art.' (Gordon, 1991 p.16) [177] Liberalism did not dismiss the need for government, but rather, and this is what Foucault saw as distinctive about liberal governmental rationality, it dissolved the immediate unity between knowledge and government, and consequently the equation of maximising governmental effectiveness with maximising governmental regulation. (Burchell, 1991 p.138-9) [178] In doing so liberalism brought into being a new relationship between knowledge and government, involving what Colin Gordon has succinctly described as 'a new mode of objectification of governed reality', that resituates 'governmental reason within a newly complicated, open and unstable politico-epistemic configuration.' (Gordon, 1991 p.16) Foucault called this new configuration of knowledge and techniques of rule *governmentality*. He described this as the

> ensemble formed by the institutions, procedures, analyses and reflections, the calculations and tactics that allow the exercise of this very specific albeit complex form of power, which has as its target population, as its principal form of knowledge political economy and its essential technical means apparatuses of security. ... this type of power which may be termed government, (results) on the one hand, in the *formation of a whole series of specific governmental apparatuses*, and on the other, in the *development of a whole complex of savoirs* [knowledges]. (Foucault, 1991c p.102-3: emphasis added)

This relationship between particular, more or less formalised bodies of knowledge and specific administrative mechanisms has become a crucial feature of government in advanced liberal societies. Increasingly in such complex societies government, the conduct of conduct, necessarily relied on the role of professional expertise. As Donzelot has demonstrated, throughout the nineteenth century there was a proliferation of alliances between private and professional agents that led to the formation of a series of welfare programs directed at governing perceived problems within the social body. (Donzelot, 1993; 1979) Over time these welfare programs became linked with the functions and institutions of the state, however, the adoption of these welfare programs by the state did not lead to the rise of an all-powerful, interventionist state. Instead it resulted in the bringing together of a diverse network of arguments, projects, and mechanisms through which various political forces sought to pursue a multitude

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[177] Gordon cites Foucault's lecture at College du France, 28 March, 1978.

[178] Burchell cites Foucault's 'Naissance de la biopolitique', in Resumes des Course.

of social and political objectives. Thus welfare did not represent a coherent, state plan for social regulation and normalisation, but rather was composed of a series of networks assembled from diverse, often antagonistic elements. Modern social welfare did not originate as centrally directed projects of state action but was 'a composition of fragile and mobile relationships' between non-state professionals, intellectuals and social movements, and state agencies. (Rose and Miller, 1992 p.192-3) Hence, the development of social welfare and subsequently the welfare state involved forging and maintaining alliances and networks between diverse experts and political forces, of which the state was only one. In a similar way the development of programs of environmental security can be understood as drawing on an equally complex, open and unstable 'politico-epistemic configuration'. Such a perspective suggests that while the aspirations for an ecological 'police science' may well exist, the issues raised by the liberal critique of government mitigate against the success of straightforward technocratic solutions to ecological problems.

The modern discourse of scientific ecology

Consistent with Foucault's analysis of the rise of biopolitics, the problematisation of the relationship between population and the environment can be linked to three major social developments in the eighteenth and nineteenth centuries. These were the emergence of modern biology as the science of life, the rapid increase in the population of Europe leading to a series of mass migrations to other continents, (Foucault, 1991c p.98; Worster, 1987b p.92-5) and the development of an international capitalist market. (Dreyfus and Rabinow, 1982 p.135; Rabinow, 1984b p.17-8; Worster, 1987b p.92-5) Work by environmental historians has emphasised the importance of the interaction between European population growth, migration and the development of international markets in the same period pointed to in Foucault's work on the emergence of biopolitics. Foucault was interested in 'the deep historical link' between the emergence of biopolitics and the population-resources problem, which he describes as 'the process which isolates the economy as a specific sector of reality and political economy as the science and technique of intervention of government in that field of reality.' (Foucault, 1991c p.102) The environmental historian David Worster has argued that the 'two great global forces' of population growth and world markets drove social changes in the nineteenth century resulting in an 'environmental upheaval' that was to 'remake nature with geological effectiveness.' (Worster, 1987b p.95-7) [179] Richard Grove has argued that new forms of management of colonial environments in the period 1670 to the mid-1950s, such as forestry, irrigation and soil conservation, had a more profound

[179] See also Crosby (1986).

'political' impact than many of the other more 'conspicuous and dramatic aspects of colonial rule.' (Grove, 1990 p.17)

Foucault saw the emergence of biopolitics in the eighteenth century as linked to an expanding series of population discourses focusing on health, criminality, education, sexuality, etc. Interestingly, at this same time we also find evidence in the historical scholarship of the beginnings of another new discourse that had as its object what today we would call *the environment*. Worster, for example, placed the first systematic documentation of concern about this new problem with the publication in 1864 of Man and Nature by George Perkins Marsh, a work that sought to demonstrate the danger to humanity and the rest of nature posed by rapid change in the global environment. (Worster, 1987b p.91-2) [180] Clarence Glacken also identified Marsh's work as marking the arrival of a recognisably modern perspective on the relationship of humans to nature. The nineteenth century thus saw, in Glacken's words, the advent of 'an entirely different order, influenced by the theory of evolution, specialisation in the attainment of knowledge, (and) acceleration in the transformation of nature.' (Glacken, 1967 p.704-5) Anna Bramwell in her history of environmentalism similarly points to modern ecological concepts as deriving from 'a set of biological, physical science and geographical ideas that arose separately around the mid-nineteenth century.' (Bramwell, 1989 p.15) [181] Malthus's ideas on population, published in An Essay on the Principle of Population at the close of the eighteenth century, along with Darwin's The Origin of Species published in 1859, were seen as providing key themes discernible in the modern ecological analysis of environmental problems. (Pepper, 1984 p.91-103; Worster, 1987a) [182]

The population-resources problem, the central theme of the nineteenth century discourses pointed to by both Foucault and environmental historians, remains central to the contemporary discourses of ecological crisis. A range of works influential in the environmental debate of the last four decades had as their key focus the notion of the carrying capacity of the Earth, which was seen as a biological law with a profound influence for contemporary environmental and population-resources problems. While the emphasis and political implications drawn from this idea vary, most saw population growth as a fundamental factor in ecological crisis. Well-known examples of this approach include Hardin (1968),

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[180] In Britain the establishment of the first national environmental group was in 1865 (the Commons, Open Spaces and Footpaths Preservation Society). The US Sierra Club was formed in 1892. See Pepper (1984) p.14. There was also a proliferation of colonial geographic and conservation societies during this period. See Schneider (1990) and Grove (1990).

[181] See also Lowe and Goyder (1983) p.16.

[182] Worster notes that the bio-economic approach of post-World War Two systems ecology displays a diminished reliance on earlier Darwinian evolutionary influences. (p.331) See also Grove (1992)

Ehlrich (1968), Meadows *et al.*, (1972) and The Club of Rome, Goldsmith (1972) and The Ecologist, and governmental reports such as that of the U.S. Council on Environmental Quality (1981). Other influential works on ecological crisis placed less emphasis on absolute population levels as the cause of environmental degradation. Instead these often focused on the problem of global pollution, and the mode and intensity of resource exploitation, which was in turn seen as related to population levels, and industrialism (and consumerism) as a system of production. Here the central concern was the impact of new forms of technology which have proliferated in the post-World War Two period, [183] and which are characterised by the extensive manufacture and use of synthetic, toxic chemicals. Carson (1962), Commoner (1971), and Bookchin (1962) were important examples of this work.

These and numerous similar works have several important features in common. Each problematised the environment as the previously taken for granted biological basis for human life and constituted it politically as a 'topic of social concern and potential conflict.' (Cramer *et al.*, 1989 p.96) Each sought to locate their claims to authority within the framework of a global ecosystems approach to ecology,[184] whether it be Hardin's and Ehlrich's biological law of carrying capacity, Commoner's four laws of ecology,[185] or The Club of Rome's complex computer modelling of the limits to growth[186]. Central to each was the view that human populations are constrained by the operation of ecological laws that were biological and therefore both natural and non-anthropocentric. These ecological laws were understood as having significant economic and political consequences, and were frequently expressed in the economic form of externalities impacting on ecologically defined public goods.[187] The concern of this contemporary discourse was (and is) how to manage populations and resources in relation to their natural environments. This focus remains central to current environmental discourses; it is, for example, a clear theme in the Brundtland report to the United Nations (Brundtland, 1987) and the ongoing international debate on sustainable development since the publication of that report. This continues to be evident in the 1992 United Nations Earth Summit (Brown *et al*., 1990; MacNeill *et al.*,

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[183] It is these sort of developments and their effects that Beck (1992b) focuses on as the key distinguishing feature of 'risk society'.

[184] I discuss the significance of global ecosystem modelling for a biopolitics of the environment later in this Chapter, and also in Rutherford (1997a).

[185] Commoner's laws: 1. Everything is connected to everything else; 2. Everything must go somewhere; 3. Nature knows best; and, 4. There is no such thing as a free lunch. (Commoner, 1971 p.33-46)

[186] These limits are presented as the interaction between world population, industrialisation, pollution, food production, and resource depletion. See Meadows et al, (1972) p.29.

[187] Public goods in this case are often defined in terms that include a broader, non-anthropocentric biotic community, as well as human beings.

1991) and the establishment of the UN Sustainable Development Commission and the 1994 UN Population Conference.

Expertise and governmentality

Before looking specifically at the development of these programs of environmental security and governance, it is necessary to consider in more detail the connection between expert knowledge and governmentality. In doing this I draw in particular on the work by Nikolas Rose and Peter Miller on governmentality. This work emphasises that the exercise of political power in advanced liberal societies depends to a significant degree on the way in which the intellectual resources, technical activities and social authority of expertise are mobilised to govern the conduct of individuals and populations. (Rose, 1993; Rose and Miller, 1992)

A major consequence of Foucault's approach to the problem of government is that it calls into question the straightforward equation of political power with the actions of the state. Thus Foucault's critique of sovereignty argued that political thinking had attached 'excessive value' to the role of the state in government. For Foucault, and later governmentality theorists such as Rose and Miller, the problem of government is not confined to the state. Following from Foucault's analysis of liberalism, 'government' should be understood as encompassing a much broader range of forces which, in a variety of ways, have sought to manage and regulate the behaviour of the population, both in its biopolitical 'aggregate effects' and in its disciplinary 'depths and details'. (Foucault, 1991c p.102) Foucault therefore argued that it is a mistake to attribute the state with the degree of coherence or 'rigorous functionality' that Western political thinking has traditionally done. Rather than the state being a calculating political subject or centre from which power emanates, it is in fact a historical sedimentation made up of a multitude of techniques for governing conduct, to which the state has attached itself in various ways. Indeed Foucault suggests that the

> governmentalisation of the state is ... what has permitted the state to survive, and ... if the state is what it is today, this is so precisely thanks to this governmentality, which is at once internal and external to the state, since it is the tactics of government which make possible the continual definition and redefinition of what is within the competence of the state and what is not, the public versus the private, and so on; thus the state can only be understood in its survival and its limits on the basis of the general tactics of governmentality. (Foucault, 1991c p.103)

In effect then, the modern state must be seen not as that which gives rise to government, but as one important, yet nonetheless historically contingent form that government has taken. Such an approach to understanding government emphasises the multiplicity of the practical knowledges and techniques brought to

bear on the general domain of the population in order to render it amenable to intervention and regulation. (Miller and Rose, 1993 p.77-8) According to Foucault, a central feature of Western modernity, from the eighteenth century onwards, is thus not the '*etatisation* of society' but 'the 'governmentalisation' of the state'. (Foucault, 1991c p.103) As indicated earlier in this chapter, this governmentalisation developed around biopower with its problematisation of human beings as *living*, biological beings and which Foucault saw as marking the point at which Western society could be said to have crossed the 'threshold of modernity'. (Foucault, 1990).

Developing his earlier notion of power/knowledge, Foucault's work on governmentality emphasised the centrality of knowledge to the practice of government. This is a theme that has been further developed by Rose and Miller, who stress that governmentality has a distinctively discursive character. In particular they argue that language must be understood as *performative*, so that the way in which language is employed in political rationalities is not simply contemplative or even descriptive. Rather it is the means through which the specific domains of governmental concern are constituted and made amenable to intervention and regulation. (Miller and Rose, 1993 p.78-81; Rose, 1993 p.288-9; Rose and Miller, 1992 p.177) Pivotal to this is the production and mobilisation of systematic bodies of knowledge relating to the particular social domain in question. Rose argues that throughout the late nineteenth and first half of the twentieth centuries, the authority of social science expertise became intimately connected with the apparatus of formal political rule, culminating in 'welfarism' or the welfare state. The key point however, is that while this professional expertise provided a *social* means of governing behaviour, it also enabled this for the most part to be done in a way that was removed from detailed and comprehensive political direction by the state. This liberal welfarism facilitated both the formulation of social norms and consequently the social evaluation of individual conduct against these, while maintaining a considerable degree of separation between the normative, truth-producing activities of professional authorities and the exercise of the coercive capacities of the state. Keeping much of the knowledge producing activities of the social sciences removed from centralised political control thus continued what Foucault described (in relation to political economy) as the 'lateral' role played by knowledge in the liberal art of governance. (Gordon, 1991 p.16) As Nikolas Rose points out, for liberal welfarism

> The truth claims of expertise were highly significant ... through the powers of truth, distant events and persons could be governed 'at arms length': political rule would not itself set out the norms of individual conduct, but would install and empower a variety of 'professionals' who would, investing them with authority to act as experts in the devices of social rule. (Rose, 1993 p.285)

Rose goes on to argue that over the past fifty years, such welfarist 'strategies of rule' have undergone fundamental changes. This has been due in part to the neo-liberal critique of the supposed failures of the welfare state, but also because welfarism itself laid the basis for new techniques of rule, which he regards as fundamental to constituting *advanced liberalism* as a distinctive mode of government. [188] Advanced liberalism establishes a different relationship between government and expertise - unlike welfarism, the emphasis is not on *social* rule but rather it seeks to govern through 'the regulated choices' of *the individual*. At the same time it attempts to affect a further separation of professional expertise from the state through marketisation and the subsequent subjection of expert knowledge production to 'the rationalities of competition, accountability and consumer demand.' (Rose, 1993 p.291-2)

Rose's argument is directed particularly at the social sciences and economics, and as he suggests, the discontinuity between welfarist and advanced liberal strategies of rule should be understood as different *problematisations of rule* rather than as a strict periodisation. (Rose, 1993 p.285) The degree to which ecological governmentality can be characterised in this way is a matter that I will return to in the final chapter. Here I will note that the problematisation of the environment as an object of government would appear, at least in northern Europe, to give credence to the notion of an ecological version of the welfare state. However, it is certainly the case that since the late 1980s there has been considerable debate about 'state failure' with respect to environmental protection and increasing attention to the role of market-based instruments in regulating environmental behaviour.[189]

Rose and Miller (1992 p.178-9) suggest that governmental (or political) rationalities characteristically possess moral, epistemological, and idiomatic elements. [190] It is the epistemological character that is perhaps most important in environmental discourse, for it is in this domain that governmental rationalities are articulated in terms of a specifically ecological knowledge of the objects and problems to be addressed. In this case the epistemology originates in scientific ecology: it is this that provides the authoritative accounts of the sorts of entities which environmental government must be concerned with managing - ecosystems, global climate and atmospheric processes, habitat and species diversity, population and carrying capacity, etc.

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[188] There is a parallel here with theorists such as Beck, who argues that 'risk society' comes into being partially as a result of the success of welfarism and economic growth. See Chapter 4 of this thesis.

[189] See Eckersley (1995), and also my discussion of notions of 'ecological modernisation' in Rutherford (1999a).

[190] In particular, environmental concerns have produced a vast outpouring of discourse on ethical and normative questions.

Ecology as regulatory science

Hence, consistent with Rose and Miller's characterisation of governmental rationalities, scientific expertise can be said to be fundamental to the both the political and epistemic definition of contemporary environmental problems.[191] In its modern form ecology emerged in the 1940s and 1950s, based on an 'energy-economic model' of the environment in which the essential feature was the flow of energy through ecosystems. (Jamison, 1993 p.189; Worster, 1987a p.311, 339) This *bio-economic* paradigm, or systems ecology, is a product of twentieth century science, a distinctly transnational enterprise drawing upon European and US national scientific traditions, but appearing in its contemporary form in the US in the period since World War Two. Despite the popularising of nature in holistic, and sometimes organicist terms, the bio-economic model can be said to express an 'agronomic attitude toward nature' which has sought to provide the analytic tools needed to 'intensively farm' the Earth's resources. (Jamison, 1993 p.193)

The language of modern systems ecology reflects this, abounding with agronomic and economic terms such as producers, consumers, total energy income, yield, crop, gross and net productivity, nutrient capital, competitive exclusion, energy budget, efficiency, etc. Modern scientific ecology from the 1940s came to see itself as 'the science of natural economics' in which nature became a 'a modernised economic system, ... a corporate state, a chain of factories, and assembly line'. Not surprisingly conflict is often seen as having 'little place in such a well-regulated economy.' (Worster, 1987a p.311-13) By the mid to late 1980s, this science-based model of the social relation to nature was increasingly incorporated into a set of governmental programs based on a political rationality that Albert Weale has labelled *ecological modernisation*. This perspective challenges the view of an inherent conflict between environmental protection and economic growth *per se* and instead sees the maintenance of a healthy environment as an *essential precondition for long-term economic development*. (Weale, 1992 p.31) [192] This view shaped the emergence of a complex raft of 'sustainable development' policies that by the early 1990s had gained widespread influence with national governments and international

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[191] This is particularly evident when one considers the importance of complex mathematical modelling of the global environment (popularised by The Limits to Growth). The current approach to global warming is a far more sophisticated, and more politically influential, response involving more complex computer modelling of global phenomena than that of The Limits to Growth three decades ago. See Buttel and Taylor (1992) p.218, 221-2, and Rutherford (1997a).

[192] The claim that economic development and environmental quality are mutually exclusive is associated with the counter-cultural aspects of environmentalism (eg 'deep ecology') – or what Eder describes as the purity model of nature. See Chapter 4 of this thesis. See also (Eder, 1996)

institutions through the United Nations Conference on Environment and Development process.[193] Ecology can thus be seen as developing from the 1950s and extending into the 1990s, as the rationale behind a new, and increasingly influential, form of political economy.

The rise of the systems approach to ecology occurred in a very specific historical and cultural context. In a general sense systems ecology appears as the product of the industrialisation of science. The emergence of 'big science' during and after World War Two saw the organisation of scientific research in the US along large-scale, capital-intensive, corporate lines, where research output increasingly became an important contributor to economic growth and national power. Applied systems ecology in this period gained significant impetus from work conducted by the US Atomic Energy Commission, originating in the Manhattan Project, into the problems of nuclear waste and radiation ecology. (Kwa, 1993) Jamison points to three ways in which the post-war development of modern systems ecology was shaped by the US institutional and cultural context in which it emerged. First the industrialisation of science and the influence this new industrial setting had on generating the view of ecology as 'a powerful technique of social engineering ... (which could potentially) ... regulate and control the flows of pollutants and other human interventions through large scale ecosystems.' (Jamison, 1993 p.197-8) Second, the availability and popularity in the US of powerful computer technology that allowed the unparalleled application of mathematical models to natural processes. This was a direct extension of the conceptualisation of ecological interactions as cybernetic, 'self-regulating, feedback systems' that had emerged originally from the use of computers in the Manhattan Project for the development of weapons guidance systems. Third, an American tradition combining the influence of a utilitarian Progressive-era conservation philosophy with the legacy of pragmatic regional planning programs of the 1930s facilitated the development of an approach to ecology that lent itself to large-scale environmental control and management. (Jamison, 1993 p.194-8; Worster, 1987a p.312)

While the industrialisation of science, including ecology, became evident in the US towards the end of World War Two and grew during the 1950s, environmental concerns throughout the 1950s and early 1960s tended to reflect the professional interests of scientists. (Cramer *et al.*, 1989 p.96-7) These professional research interests played a significant role in the development of a coherent, science-based environmentalism through the International Geophysical Year (1957-8) and the International Biological Program (1964-74). The IBP in particular was a massive transnational enterprise involving research in 97

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[193] The UNCED report, Our Common Future (Brundtland, 1987) provides a particularly clear statement of how this new political rationality is deeply embedded in the discourse on sustainable development.

countries directed towards the understanding of the biological basis of productivity and human welfare. The work of the IBP emphasised areas of research which were 'calculated to benefit from international collaboration, and were urgent because of the rapid rate of changes taking place in all environments throughout the world.' The focus of the IBP was distinctively *ecological* in character, being directed towards understanding 'organic production ... and the potentialities and uses of new and existing natural resources, ... (as well as) human adaptability to change.' (Worthington, 1983 p.165) [194]

The sorts of extensive, transnational research programs on ecological issues mentioned above came throughout the 1960s and 1970s increasingly to characterise scientific and political discourse on the environment. From the end of the 1960s, through the establishment of a wide range of environmental legislation and enforcement agencies, the advanced industrialised countries experienced a rapid growth of state intervention directed at environmental regulation and planning. Ecological and environmental research in the 1970s thus laid the foundation for public policies of significant economic and political impact, particularly in terms of the regulatory intervention in the activities of industry. In financial terms alone these are significant,[195] however of more general importance is that the period since the early 1970s has seen the significant institutionalisation of what could be described as forms of *ecological governmentality*. Two important aspects of this have been the growth of what has been described as *regulatory science*, and the international spread of procedures for *environmental impact assessment* (EIA).

Sheila Jasanoff has used the notion of regulatory science to characterise the widespread reliance of the advanced industrial state on extensive networks of expert scientific advisory bodies. The increasing integration of science and policy making has become a central feature of environmental (and health) regulation in such states (Beck, 1992a; Hart and Victor, 1993; Jasanoff, 1990) as well as in international institutions and processes. (Hass, 1990) [196] Adapting the

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[194] For discussion of the importance of the IBP for the growth and institutionalisation of modern scientific ecology, see Kwa (1987); Bocking (1995); Caldwell (1991) p.261; Egerton (1983) p.268-71; Golley (1993) p.109-166; McIntosh (1985) p.213-41.

[195] For example, the direct cost of complying with US pollution control regulations is estimated to be in excess of US$100 billion per year (Jasanoff, 1992 p.195). The US commercial market for the transport, storage and disposal of hazardous wastes alone was $US 3,000 million per year in 1997, while environmental remediation and consulting services was around $US 8,000 million in the same year. (HazNews, 1998 p.1)

[196] Hass uses the term 'epistemic communities' to refer to the role played by scientists in bringing specialised knowledge into the policy-making process on environmental issues at the transnational level. While Hass and his supporters are cautious about the applicability of this approach beyond the specific cases studied, the work of Jasanoff (1990), Jamison (1993) and others clearly suggests that a rigid separation between 'science' and 'policy' and the

'governmentality' approach to encompass the phenomenon of regulatory science focuses attention on the key political role such expert advisory groups play as loci of epistemological legitimation and policing. By framing the definition of ecological risks and by certifying what is to count as scientifically acceptable knowledge of the natural world, regulatory science and the extended 'epistemic communities' of policy makers with which such science is integrated, provides what Rose and Miller (1992) term 'the intellectual machinery of government'. While attempts to define environment-society relationships in terms of systems ecology produce a high level of technical uncertainty and thus the potential for social conflict, regulatory science can be understood as an example of how liberal governmentality disassociates the 'substantive authority of expertise from the apparatuses of political rule'. (Rose, 1993 p.285) This is a theme that also emerges in the work of Beck, although with somewhat less sophistication than is evident in that of the 'governmentality' approach.

The rapid expansion of social regulation associated with the growth of discourse on ecological problems from the 1970s produced a largely new domain for the biopolitical administration of life. The population became the target for a new form of *ecological* security and welfare in which environmental agencies and the professional disciplines required by them set about the task of protecting the public from hazardous and environmentally damaging technologies. Such programs of government demanded 'ever more complex predictive analyses of the risks and benefits of regulation.' (Jasanoff, 1990 p.3) As Brian Wynne has noted, the regulatory 'turn to science', as an attempt to provide greater stability and legitimacy in environmental policy, 'also in important respects ... defined society, by tacitly defining the scope and nature of social intervention in public policy risk decisions.' (Wynne, 1992 p.746-8) The increasing importance of ecology as a regulatory science is therefore a particularly significant articulation of the biopolitics that Foucault saw as characteristic of modern governmental rationalities. The emergence of ecology as a regulatory science is clearly linked to the growth of 'big science', despite the anti-corporatist orientation of many environmental movements. Indeed a notable feature of regulatory science is the central role state agencies and industrial interests (especially transnational corporations) play in the normative constitution of ecological knowledge, that is, in the manufacture, negotiation and certification of knowledge. (Wynne, 1992 p.754) Regulatory ecological science does not so much describe the environment as both actively constitute it as an object of knowledge and, through various modes of positive intervention, manage and police it.

These biopolitical strategies for the regulation of the ecological life of entire populations could be regarded as illiberal, inasmuch as their focus is less on the

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'domestic' and 'international' manifestations of the science-policy interrelationship is open to question.

interests of the individual than on the population and the broader 'ecosystem'. However in some regards *the environment* can be understood in much the same way as *the economy*; for liberal government the task would thus be how to take proper account of this *other* natural realm, particularly given the close interdependence between the two. Posed in this way, the problem of nature is subject to the same sorts of questions regarding the methods of rule as are applied to the economy. The ecological injunction that everything is connected to everything else reproduces in the environmental sphere a problem similar to that of the opacity of economic processes, and suggests also the impossibility of a comprehensive environmental sovereignty. One the one hand, environmental problems are subject to natural laws, and must therefore be dealt with by technical means based on expert knowledge. On the other hand, governmental authorities (both state and non-state) must also take into account the effect that these natural processes have on the wealth and welfare of citizens, both collectively at the level of the population and as individuals and hence their effect on 'the economy'. This raises the problem of the *legitimacy* of such authorities. (Rose, 1993 p.292)

The resort to scientific expertise, particularly in the institutional form provided by regulatory science, is in this respect consistent with the liberal response to the dilemma of too little government versus too much. As was seen in previous discussion of Beck, the lack of a political centre capable of subjecting the 'mega' risks generated by economic and technological development to any effective form of public accountability or authorisation is a chronic problem for ecological discourse. If as I have argued, environmental problems are yet another side of what Foucault called the 'population-riches problem', it will be impossible in practice to separate ecological issues from the sorts questions that arise for liberalism in relation to governing the economy. This is not to suggest that the responses will be identical, but simply that the problem of governing the environment will be subject to a similar set of constraints, as governing environmental performance means intervening in the economic activities of individuals and companies. [197]

Environmental assessment & modelling as technologies of government

Foucault suggested that it is often in the mundane and humble procedures of examination and assessment at the micro-level that we can discern the operation of biopower. In this context the technique of environmental impact assessment (EIA) provides a useful illustration of one aspect of ecological governmentality. As noted above, a major element in the response to environmental problems from

[197] One need only look at the burgeoning of environmental economics as a significant discipline in the past twenty years to appreciate this point.

the 1960s onwards has involved substantive legislation aimed at regulating particular pollutants. However, the 1969 introduction of the US National Environment Policy Act (NEPA) marked an important departure from this traditional legal-juridical path. The NEPA adopted a procedural approach to environment protection requiring the preparation of detailed environmental impact statements for major development projects that had the potential to significantly affect the environment. By the 1980s the US EIA process had been adapted and implemented in one form or another in many other industrialised countries. EIA sets out statutory criteria for ecological assessment requiring government agencies to take account of these criteria in their decision making.

However, EIA goes beyond legislating for a science-based, 'rational-comprehensive' assessment and decision-making process. While studies do point to the capacity of EIA to improve the effectiveness, coordination and legitimacy of environmental planning decisions, others suggest that these legal-formal mechanisms also utilise a range of what Wandesforde-Smith has described as 'powerful, informal incentives' within government to 'produce agencies that continuously and progressively think about environmental values.' (Bartlett, 1990 p.90) EIA can be understood as operating in a highly flexible, *self-regulating* manner involving continuous mediation between the internal formation of environmental programs and objectives within organisations (not just state agencies but also non-governmental organisations and private corporations), and the external political and economic context within which these operate. This suggests that EIA processes have the ability to implement environmental management not simply by juridical 'command and control' methods. Rather, through a set of ecological norms and administrative procedures, it is capable of channelling problem solving in particular directions that stimulate State agencies, private companies and other social actors to be both innovative and effective in the implementation of ecological goals. (Bartlett, 1990)

Bartlett argues that where EIA is successful, that is, where it substantively influences the direction and outcome of environmental planning and economic activity, it does so 'by changing, formally and informally, the premises and rules for arriving at legitimate decisions.' (Bartlett, 1990 p.91) Thus he argues that EIA creates an 'insidious' mechanism for imbedding ecological modes of thought and environmental values into the actions of organisations and individuals.

> By establishing, continuously reaffirming and progressively legitimating environmental values and ecological criteria as standards by which individual actions are to be structured, chosen, and evaluated, EIA institutionalises substantive ecological rationality. ... It changes patterns of relationships among organisations and among individuals inside and outside organisations. It creates powerful incentives, formal and informal, that thereafter force a great deal of learning and self-regulation upon individual and organisational actors. And it provides opportunities for

> individuals to develop and affirm environmental values and to press for innovative adaptation of structures and processes to a changing political world. (Bartlett, 1990 p.91-2)

The particular strength of EIA, and that which separates it from the simple legislative imposition of controls (such as permissible discharge levels for pollutants), is that it *structures the institutional and normative fields in which actions and governmental programs take place without specifying final outcomes*. It establishes a governmental technology, which simultaneously guides and problematises actions in relation to the environment in which juridical techniques are subsumed under the effectivity of the norm. These sorts of techniques also incorporate what Foucault described as a 'pastoral' attitude, where government is understood in terms of the metaphor of 'the shepherd and his flock'. Such a view sees the goal of government as the promotion of 'the well-being of its subjects' by means of an intimate and continuous regulation of behaviour, [198] and is thus more concerned with the *welfare* or *security* of subjects than is the liberal concern with autonomy. This is a basic normative perspective, which is deeply embedded in almost all schools of environmental thought - the notion of wise stewardship as fundamental to the management of all-encompassing ecological relationships.

The EIA process (including the conduct of scientific environmental impact studies) is often criticised because these are generally conducted by the development proponents themselves, and as a consequence frequently suffer from 'technical flaws', 'incomplete presentation of information' and therefore cannot be regarded as a substitute for 'overall planning'. (Walker, 1989 p.33) Such an argument may miss the point, [199] for it is precisely by incorporating the developer and other non-environmental state agencies into the *process of problem definition* that EIA internalises and normalises ecological analysis and behaviour within individual and organisational actors. This of course is not to suggest that such techniques cannot become co-opted to immediate, short-term political manoeuvring by politicians and governments - clearly, they can be and are from time to time. [200] Nor is it to suggest that the proponents of developments do not pursue commercial self-interest – the question is, under what political rationality

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[198] Foucault saw the practice of police science as clear example of this pastoral attitude. See Foucault (1981c) and also Hindess (1996) p.118-23.

[199] See also Rutherford 1994b.

[200] It is perhaps the case that EIA 'works' best as a technology of government the more distant it is from the political interventions of executive government. This is because a development that is a political issue for politicians is one that has by definition already mobilised powerful competing interests, and these interests have brought the issues into the arena of executive government as part of a strategy aimed at protecting those interests. Anyone with practical experience in environmental regulation will know that the number of development projects that become political issues in this way is a relatively small proportion. In most cases, it is simply much easier and far quicker to do what is necessary under the EIA process.

are such interests pursued, and what effect does this have on the way actions are governed? That these questions will almost always be overlaid with other particular economic and political effects needs to be considered.

Nevertheless, at the broader strategic level of political rationalities, EIA can be described as a means of *institutionalising ecological rationality* in governmental and social choice mechanisms. (Bartlett, 1990 p.88-9) EIA is of course in part a regulatory mechanism in the legal-juridical sense, but it is more than this. It attempts to enhance the effectiveness of government (in the Foucauldian sense) in regulating the complex and multiple materiality of the species body, both by institutionalising a scientised form of administrative apparatus, and more importantly perhaps, by opening up the species body (population) in a new way to that generalised 'modality of intervention' characterised by Foucault as *panopticism*. Hence, a fundamental feature of EIA is that it also functions as a normalising strategy, that is, it does not mandate specific outcomes from the centre, but sets up a framework for *rationalising* behaviour in particular ways. In other words, EIA brings into being new relations of power through an interpenetrating cluster of positive norms of internal self-control and external regulation that effect a policing of specific practices of the population, both at a general institutional level and through what Foucault describes as a 'positive intervention in the behaviour of individuals.' (Foucault, 1988b p.159) Using Mitchell Dean's (1998b) terminology, Environmental Impact Assessment can be described as a *technology of performance*, as it functions 'to monitor, compare, and evaluate the performance of those whose agency is thereby activated.' Such technologies of performance are 'utilised from above, as indirect means of regulating agencies, at transforming professionals into "calculating individuals" within "calculable spaces", subject to particular "calculative regimes", to use Miller's language (1992).' (Dean 1998b, p.36)

Another illustration of these relations of biopolitics in the natural sciences can be found by examining the role played by computer modelling in the construction of knowledge of global environmental change, or the 'greenhouse effect'.[201] The discourse on global environmental change has many of the characteristics previously discussed. Within the institutional context of a highly technical, transnational science, the extension of scientific knowledge to the world beyond the laboratory involves the interpretation of outputs of complex computer models of the global atmosphere and oceans, [202] along with the techniques of monitoring and standardisation in which such knowledge is embodied. As I shall discuss further in subsequent chapters, the extension of this type of apparently esoteric scientific knowledge outside the laboratory necessarily involves an adjustment of

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[201] The example used here previously appeared in Rutherford (1997a) p554-6.

[202] Known as 'general circulation models'.

'non-scientific practices and situations' outside of the laboratory so as to make these 'amenable to the employment of scientific materials and practices'. (Rouse, 1987 p.211) Extending scientific knowledge and techniques outside of the laboratory brings about a strategic realignment of power relations by disciplining and structuring the social and physical environment in which non-scientific agents act.

The specific consequences of this are illustrated by Taylor and Buttel, who argue that the largely uncritical acceptance by social scientists and environmental movements of the unproblematic 'reality' of the knowledge-constructs of the natural sciences is instrumental in the production of a complex set of hierarchical political and economic alignments. (Buttel and Taylor, 1992) These alignments are shaped by the theories, techniques, and instruments of highly formalised physical sciences and of systems ecology, which privilege 'global constructions of ecological knowledge' in ways that allow programs of environmental management to be grafted onto a set of dominant 'geo-political institutions'. (Buttel and Taylor, 1992 p.226) In particular, the privileged status accorded to theories and models drawn from the physical sciences has facilitated the development of a strategic 'coincidence of interests' between environmental groups, scientists, and institutions such as the World Bank and international development agencies, which seek to discipline future development in the less developed States. (Taylor and Buttel, 1992 p.412)

The scientific construction of knowledge of the global environmental risks aggregates population and resources in ways that obscure the differential impact of environmental problems and policies on regional and local populations and groups within those populations, or as Beck argues, that cut across traditional interest alignments. Thus, Taylor and Buttel argue that such technical knowledge constructions function simultaneously as a scientific concept and as an 'ideology' that helps structure sociopolitical relationships in particular ways 'to erect a new global regulatory order'. (Buttel and Taylor, 1992 p.222) This regulatory order reflects the way in which the government of environmental risk produces 'a division between *active citizens* (capable of managing their own risk) and *targeted populations* (disadvantaged groups, the 'at risk', the high-risk etc) who require intervention in the management of risks. (Dean, 1998b p.35) As Dean notes such a division involves the deployment of quite different types of governmental technologies, and is characteristic of neo-liberal 'prudentialism' which relies on the enhanced role of professional expertise, especially that associated with the prediction, quantification and prevention of risk factors. [203] Environmental Impact Assessment discussed above is an example of a type of governmental technology

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[203] The issue of ecological risk, as I have argued in Chapter 4, is a central concern in Beck's work. Dean (1998b) provides a highly perceptive critique of Beck's somewhat simplistic treatment of risk, by drawing on the work of Foucault and governmentality studies.

applied to active citizens – it is primarily directed at professionally educated engineers, business people and government officials capable of 'regulated autonomy' to use Rose and Miller's (1992) terminology. It differs from the governmental technologies applied to targeted populations such as school children whose exposure to high levels of ultraviolet radiation in the summer months is regulated through the disciplining of dress codes and spatial distribution (in the school ground) of the 'at risk' population.[204]

Central to global climate science is a reliance on complex computer modelling of the global environment that incorporates the systems approach to ecology referred to earlier in this chapter. Since the 1970s there have been two major elements in such global modelling. The first involved the use of the concepts of system dynamics to make predictions about the impact of future population growth, resource use and pollution output on the world economy and environment. This resulted in The Limits to Growth report which used these computer simulations to argue that continued population growth would lead to the depletion of the world's stocks of non-renewable natural resources and precipitate a global economic collapse, unless coordinated policies for a no-growth, 'steady-state' economy were implemented world-wide. (Meadows *et al.*, 1972) The Limits to Growth was both widely criticised and defended, but regardless of the merits of the forecasts made in the report, it had a major influence in constructing the contemporary ecological representation of the world. The core of this representation is the concept of a single global system and the problematisation of the relationships between population, resources and the natural environment. The report thus provided a coherent, popularised articulation of the themes of systems ecology that was embraced by environmental movements in the industrialised countries, and which helped shape political support for new forms of environmental regulation. (Taylor and Buttel, 1992 p.409-10)

The second element of global climate modelling, in the form of general circulation models of the atmosphere, came to prominence in the 1980s. These models were initially designed to predict the future course and impact of human induced changes to atmospheric chemistry, most notably increases in carbon dioxide levels. In the late 1980s, the modelling was further extended to develop scenarios of the impact of climate change on global agriculture and biodiversity, as well as economic and security consequences. Unlike The Limits to Growth, climate modelling has been able to command substantial scientific and institutional influence and resources, both within the national science-policy communities of the advanced industrial states and within international and transnational bodies such as the United Nations and the OECD. In particular climate modelling provided both the scientific rationale and technical tools for the

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[204] See note 174 above.

work of the Intergovernmental Panel on Climate Change carried out under the auspices of the World Meteorological Organisation. It was this work which led to the establishment of a framework convention on climate change at the UN Conference on Environment and Development (the 'Earth Summit') in 1992. [205]

Conclusion

Systems ecology, and the highly mathematised natural sciences (such as atmospheric chemistry and physics) involved in global ecosystem modelling exert a powerful influence across a wide range of environmental policy and social planning areas. The ecological sciences are fundamental to key aspects of contemporary biopolitics - ecological discourse both problematises numerous areas of life while at the same time elaborating programs of environmental intervention aimed at normalising the social relation to nature in specific, ecologically benign ways. The contemporary notion of *the environment* is constituted as inherently problematic by the development of specialised scientific (as well as legal and moral) discourse on ecology. This specialised discourse provides what Rose and Miller (1992) have described as 'the intellectual machinery of government', through which social relations with nature are thematised and brought into the domain of 'conscious political calculation' through the formation of *programs of government*. Such programs

> presuppose that the real is programmable, that it is a domain subject to certain determinants, rules, norms and processes that can be acted upon and improved by authorities. They make the objects of government thinkable in such a way that their ills appear susceptible to diagnosis, prescription and cure by calculating and normalising intervention. (Rose and Miller, 1992 p.182)

Central to these activities is the production and use of knowledge by experts. The formation of ecological programs of government occurs to a significant degree within the institutional context of regulatory science, in which environmental experts simultaneously provide scientifically authoritative technical judgments and politically legitimised policies. Programs of government therefore embody knowledgeable accounts of what are considered legitimate problems, and the goals and objectives to be pursued in addressing them. However, programs must be capable of being deployed on the population, brought to bear on the 'species body' through a range of interventions and regulatory instruments. The means of making programs operable can be considered the *technologies of government*. (Rose and Miller, 1992 p.175) I have suggested that the technique of environmental impact assessment can be thought of as an

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[205] For a detailed historical study of the role of scientific elites in mediating between science and policy in the early years of climate change research see Hart and Victor (1993).

example of such a technology of government which expresses most clearly the sorts of *productive* relations of power Foucault calls biopolitics. In a similar vein Eric Darier's (Darier, 1995) study of Canada's Green Plan provides an illuminating example, in the ecological domain, of what Rose and Miller describe as a program of government. [206]

It is important to emphasise that what is being argued here is not that ecological governmentality is part of some simple, unidirectional and generalised extension of state domination of society, much less an expression of Adorno's totally administered society. Rather, the developments described here reflect what Foucault referred to as 'the 'governmentalisation' of the state'. (Foucault, 1991c) Government, understood as the attempt to implement all those more or less formally articulated plans, projects and practices that seek to systematically shape the conduct of individuals, groups and populations, is not the exclusive domain of the state. Indeed, the complexity of modern society appears to engender an increasing reliance on liberal techniques of government, which depend on governing at a distance, 'seeking to create locales, entities and persons able to operate a regulated autonomy.' (Rose and Miller, 1992 p.173) Thus, as suggested in this chapter, non-state actors, particularly professionals, academics and social movements contribute to the governmentalisation of life by entering into complex and potentially unstable relations with state agencies, other institutions and political forces.

This chapter has suggested that Foucault's work on biopolitics holds promise for a more sophisticated understanding of contemporary environmental concerns. No consideration of ecological problems can ignore the biological problem posed by the impact of populations on the available stock of natural resources. As I have shown, this is precisely the problem Foucault situates as fundamental to biopolitics. Thus there is an overlap, although not developed by Foucault himself, in which the 'entry of life into history' is both a biopolitical and ecological (or *eco-political*) phenomenon. Life in the modern biological sense, enters history precisely because the mechanisms of biological life become the objects of both 'reason of state' and 'government' in the broader sense described by Foucault. In this respect, biological life becomes simultaneously an object of scientific knowledge, state strategic calculation, market capitalisation and ethical discourse,

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[206] Darier argues that the notion of governmentality is directly relevant to understanding the application of environmental policy. His study of the Canadian *Green Plan* emphasises that it is best understood as 'a clear attempt to discipline the population by "instilling" new norms of environmental conduct and, thus, (it) constructs a new subjectivity based on "environmental citizenship".' Darier also notes that the *Green Plan* should also be seen as 'an example of resistance against other prevalent kinds of subjectification – such as the "market" – and could constitute one of the conditions for the emergence of a subsequent green "self" with all the dangers that this entails.' (Darier, 1995)

and in so doing, also becomes the subject of articulated, explicit governmental rationalities.

Chapter 7

Foucault's incomplete critique of the sovereignty

Introduction

In the preceding chapter it was suggested that because Foucault restricted his attention to the role of the human sciences in the development of biopower, he did not consider the way in which the political and economic problematisation of population give rise to a similar problematisation of the natural environment. Nevertheless, it was argued that his approach to biopolitics and governmentality could be extended to help understand the growth of environmental discourse and ecopolitical programs of government.

The current chapter turns to a consideration of Foucault's approach to the relationship between power and natural scientific knowledge. More particularly, this chapter examines the way in which his treatment of agency and the subject influenced his apparent lack of interest in the relationship between the 'hard' natural sciences and social power. This relationship is an issue on which Foucault was considerably more ambiguous than in his studies of the human sciences. As the preceding chapter has indicated, environmental discourses draw heavily on knowledge from the natural sciences. If the Foucauldian analysis of the relation between expertise, knowledge and the government of conduct is to be useful in those instances where knowledge is primarily drawn from the sciences of nature rather than of society, then it is necessary to ask whether the natural sciences are in any decisive sense less embroiled in relations of power than the human sciences?

These are the issues examined in this and the following chapter. Here my focus is on the apparent inconsistency between Foucault's approach to the natural and human sciences. I argue that this inconsistency can be explained by Foucault's failure to break with the notion of sovereignty as fully as has been claimed, both by Foucault himself and by many of those commenting on his work. One consequence of this is that while Foucault understands the subject as the product of historically contingent relations of power, discipline and scientific objectification, he nonetheless still insists on a fundamental distinction between actions on human agents and actions on non-human things.

Foucault's characterisation of the natural sciences

One problem in attempting to determine the status of the natural sciences in Foucault's work is that he does not deal with these in a comprehensive manner, and if anything, the attention they receive diminishes as his work developed over time. Thus, the most systematic consideration of the natural sciences is to be found in his earlier archaeological works (particularly The Archaeology of Knowledge and The Order of Things), in which, as Rabinow says, discourse tends to be 'bracketed off from the social practices and institutions in which it is embedded', (Rabinow, 1984a p.9-10) with the consequence that the non-discursive and institutional elements of scientific practice are not dealt with in a substantial way.

A second problem is that any attempt to apply the insights of Foucault's analyses of the human sciences to the natural sciences must confront the apparent distinction he made between the two, including the way in which he allowed a less epistemologically problematic status to certain natural sciences (eg mathematics, chemistry) than the human sciences. As with his analysis of the emergence of the human sciences, Foucault saw the earlier development of the natural sciences as having their origins in techniques of discipline and social regulation. In particular, he suggested that the investigatory practices of Church in the twelfth and thirteenth centuries, and particularly The Inquisition, provided both an 'operating model' and the 'technical matrix' for the nascent natural sciences.

It is worth recalling the connection Foucault (1979b) claimed exists here. The investigatory or inquisitorial practices arose in conjunction with the reorganisation of the Church and proliferation of the monarchical states in Europe. Its origin then was political, linked to the 'birth of the states and of monarchical sovereignty', but apart from serving this explicitly political-juridical function it also contributed, as a cluster of 'regulated techniques', to the formation of knowledge. 'In fact', said Foucault, 'the investigation has been the no doubt crude, but fundamental element in the constitution of the empirical sciences.' The 'terrible power' of the practices of investigation enabled the proliferation of the 'great empirical knowledge that covered the things of the world and transcribed them into the ordering of an infinite discourse that observes, describes and establishes the 'facts' (at a time when the western world was beginning the economic and political conquest of this same world)'. Significantly however, Foucault claims that 'although it is true that, in becoming a technique for the empirical sciences, the investigation has *detached* itself from the inquisitorial procedure, in which it was historically rooted, the examination has remained extremely close to the disciplinary power that shaped it.' (Foucault, 1979b p.224-6 emphasis added) In other words, both the natural and human sciences share a

common historical origin in disciplinary technology. Whereas the natural sciences have somehow succeeded in detaching themselves from the inquisitorial model, the human sciences with their reliance on the practices of 'the examination', have remained enmeshed in disciplinary power. (Foucault, 1979b p.227) Foucault did not elaborate in Discipline and Punish or in subsequent writings, how and why this divergence should occur.

Some explanation of this may be found in his earlier works. In The Archaeology of Knowledge, Foucault distinguished four 'thresholds' or stages in the emergence of discursive formations. [207] Perhaps most significant in considering the development of the natural sciences as largely autonomous bodies of knowledge removed from direct implication in disciplinary power, is what Foucault called the 'threshold of scientificity'. This is when the basic archaeological rules governing statements within a discursive formation are further supplemented by more specific laws or rules governing the construction of propositions in accordance with the accepted norms of a scientific methodology. (Foucault, 1972 p.186-7; Gutting, 1989 p.252-3) This indicates that the difference between the thresholds of epistemologisation and scientificity is largely, perhaps even exclusively, one of the degree of precision, rigour and formalisation. (Grumley, 1989 p.252) Certainly Foucault states that it is primarily a matter of the extent to which the statements and propositions that constitute a discursive formation obey formal criteria.[208] Elsewhere he suggests that in order to be definable as a science, an 'epistemological configuration' must possess the characteristics of 'objectivity' and 'systemacity'. (Foucault, 1970 p.365)

As pointed out in Chapter 5, Foucault's work was not a critique of rationality *in general*. Gutting's detailed analysis of the relation of Foucault's archaeology to the history of science of Bachelard and Canguilhem, demonstrates that neither was it a critique of scientific rationality nor of the natural sciences *per se*. (Gutting, 1989 p.255) The focus was not on the systematic or rigorous natural sciences, but on the human sciences, those '*dubious*' disciplines that have not yet crossed and may never cross, this threshold of scientificity to detach themselves from relations of power. Foucault's critique, therefore, was primarily directed at specific *applications* of biology to human beings (via medicine, psychiatry, etc) and to the human sciences in general, that is, it was directed at particular historical applications of knowledge dealing with the ways in which human beings, as distinct from non-human nature, are constituted as subjects by, and of, power.

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[207] These four thresholds are those of positivity, epistemologisation, scientificity, and formalisation. See Foucault (1972) p.186-189.

[208] That is, when the statements of a discursive formation 'comply not only with archaeological rules of formation, but also with certain laws for the construction of propositions.' (Foucault, 1972 p.187)

In one sense Foucault appeared to regard the natural sciences as *less* problematic, from the point of view of their connection to social power, because these have become bodies of knowledge that have crossed the threshold of scientificity to obey formal criteria in a way that gives rise to 'relatively stable practices and objects' in a manner somewhat similar to Kuhn's conception of normal science. (Dreyfus and Rabinow, 1982 p.116). In another sense, the natural sciences were treated by Foucault as *too* problematic because the relationship between sciences such as theoretical physics, organic chemistry or mathematics, and relations of social power involve what he suggested are 'excessively complicated' questions in which the 'threshold of possible explanations (is) impossibly high'. (Foucault, 1980d p.109-10) Foucault thus seemed to say that the interconnection between this type of scientific knowledge and the effects of power are extremely attenuated and not readily amenable to social analysis in a way that he found politically interesting or important. [209] His focus was thus on the human sciences, those 'dubious' disciplines such as medicine and psychiatry that are 'profoundly enmeshed in social structures'. What makes the human sciences both significant and interesting on this account is precisely the role these play in defining the historical conditions of emergence of particular modes of human subjectivity and the ways in which awareness of this historicity opens up possibilities for transforming these subjectivities.

Could Foucault's claim that the natural sciences were able to detach themselves from power relations reflect an acceptance that there is a fundamental difference between the objects of human and natural sciences? While Foucault's approach to the natural sciences is by no means that of simple realism,[210] he nevertheless did not adequately provide any strong arguments for accepting that the natural sciences, as discursive constructs, should be regarded as anything

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[209] For an interesting Foucault-influenced analysis of the 'capitalising' of molecular biology and the transformation of life into a productive force, see Yoxen (1981). While Yoxen deals with an area of biology which has become closely linked to medicine, he nevertheless shows how very clearly how 'hard sciences' of molecular biology (ie the genetics and biochemistry of recombinant DNA) have became embroiled in disciplinary practices. The relevance of Yoxen's work has substantially increased in recent years with subsequent advances in the technology of gene manipulation, particularly gene therapy in medicine and use of patented, genetically modified organisms in agriculture. Yoxen's article is also of interest in that it demonstrates the active competition between scientific interests (molecular biology and ecology) in the governmentalisation of the U.S. state.

[210] In particular see Foucault's treatment of the development of modern biology provided in The Order of Things. An Archaeology of the Human Sciences. (Foucault, 1970) This is definitely not a simple realist account, but, as Gutting demonstrates, is very much influenced by the work of French historians of science Bachelard and Canguilhem. Bachelard and Canguilhem introduced themes such as the theory dependence of observation, discontinuity and incommensurability in science, that 'preceded by two or three decades similar discussions by Anglo-American historians and philosophers of science such as Kuhn and Feyerabend' (Gutting, 1989 p.16, 33). See also Dreyfus and Rabinow (1982) p.116-7.

other than deeply implicated in the same knowledge/power matrix as the human sciences. Greater rigour and systemacity, or even predicability, of their own, are not sufficient grounds for a fundamental difference in the relationship of the natural sciences to power.

Power and capacity: the subject revisited

Foucault's work unquestionably developed very significant critical insights into the ways that subjects are constituted in relations of power, but it nevertheless confined power to relations between active human subjects. This is most evident in the distinction he drew between power and 'capacities'. Power is a mode of action upon the action of others, while the technical capacities of bodies and instruments to manipulate things do not in themselves entail relations of power. (Foucault, 1982 p.219-22) Thus Foucault differentiates capacity from power in the following terms:

> As far as this power is concerned, it is first necessary to distinguish that which is *exerted over things* and gives the ability to modify, use, consume, or destroy them - a power which stems from aptitudes directly inherent in the body or relayed by external instruments. Let us say that here it is a question of 'capacity'. On the other hand, what characterises the power we are analysing is that it brings into play *relations between individuals* (or between groups). (Foucault, 1982 p.217 - emphasis added)

What was Foucault suggesting here? Why insist on the difference between actions on things and relations of power? The obvious response is that most of modern Western political thought takes as fundamental the differences between the human and non-human, between culture and nature etc. However, given Foucault's strong critique of humanism and his insistence that human beings are historically produced by power, that is, through processes of subjectification and discipline, it becomes necessary to examine this question further. More specifically, it is important to consider this as it relates to the way in which Foucault dealt with the natural sciences. As suggested in the previous chapter, such sciences must be seen as playing a key role in the contemporary problematisation of the natural environment, and in the biopolitical (or ecopolitical) regulation of human populations that follows from this. In sketching Foucault's approach to power in Chapter 5, I pointed to his emphasis on this productive aspect of power, in contrast to the generally negative characterisation of power as domination by Habermas. It is therefore necessary to look more closely at the distinction Foucault made between power and domination.

This distinction can be illuminated by contrasting it with the approach adopted by Charles Taylor, whose criticisms of Foucault in many respects parallel those raised by Habermas. Taylor maintained that not only did power and domination necessarily imply an imposition on the significant interests or

purposes of the individual, but that it also implies the potential for liberation from this imposition. From this perspective the concept of power is therefore incoherent unless it is linked to the possibility of emancipation from power. (Taylor, 1984 p.172-4) According to critics such as Taylor and Habermas, Foucault's position does not allow this, and is thus ultimately incapable of providing a coherent normative basis for the critique of power. (Habermas, 1985 p.276) In contrast to this identification of power with domination, Foucault characterised power as a mode of action upon the action of others, that is, a relationship that involves actors who are free insomuch as the field of possible action and response is not fully pre-determined or closed. (Foucault, 1982 p.219-22) A state of domination exists when the relations of power are 'firmly set and congealed', instead of being variable and fluid. Hence, for Foucault domination was a specific outcome of power relations in which stable and relatively durable mechanisms of power replace the dynamic 'agonism' of the strategic manoeuvring between agents. (Foucault, 1982 p.222-26; Foucault, 1988a p.3)

In Taylor's approach the exercise of power, seen as imposition contrary to the will or interests of a pre-constituted subject, inevitably appears as a loss of freedom, as a diminution of the subject's capacity for autonomy and self-realisation. In this context, the claim that to talk of power without the correlative concept of emancipation from power is incoherent appears to make sense. Of course, such an approach confuses the issue of what *sort* of subject is involved. For Taylor (and Habermas) the subject that is imposed upon by power was the modern individual defined in terms of both personal autonomy and capacity for collective self-rule. (Taylor, 1984 p.178) For Foucault, the subject with its various capacities, was precisely that which must be explained in terms of the historical deployment of power and discourse. As a consequence, the relationship between power and autonomy must be understood differently. If the subject is not a pre-constituted entity that power undermines, but rather is the result of power relations, then autonomy cannot be understood simply as the absence of imposition or repression.

In this regard Paul Patton argues that even domination cannot be explained by a simple account of imposition as Taylor attempted to do. Instead domination is the product of a relatively stable system of *extractive power* resulting from an ongoing asymmetry of power relations. (Patton, 1989) [211] In other words, even in the case of domination, the relationship still relies on the 'capture' of the capacities of others,[212] and is not purely an instance of direct imposition on, or power over, a subject. What distinguishes domination then, is the establishment of

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[211] Here Patton employs Macpherson's concept of extractive power, that is, the ability 'to make use of and derive benefit from the capacities of others'.

[212] Patton is not using the term 'capacities' in the more narrow sense employed by Foucault in the earlier quoted passage, but rather more broadly as 'capacity to act' (upon the actions of others).

asymmetrical relations of power that have *congealed*, in which the 'possibility of reversal' no longer applies.

Patton distinguishes between negative and positive freedom - the absence of imposition or *power over* (a subject) is freedom in the negative sense, while an agent's capacity to act for its own ends constitutes *power to*, or positive freedom. Patton argues that by making such a distinction between negative and positive freedom, Foucault's approach to power relations becomes clearer - power relies primarily upon power to, that is, power as capacity to act upon the actions of others. The relationship between power and freedom in Foucault also becomes clearer - power is exercised over free agents and freedom is a precondition for the exercise of power. (Foucault, 1982 p.221) Power and freedom are thus intimately tied together - as primary capacity (or 'power to') power presupposes positive freedom to act. Similarly a power relation proper (as distinct from a state of domination) is a dynamic relationship between agents in which there is always the potential for a reversal of the strategic position of each party. Hence freedom cannot be reduced to an attribute of the subject, but must be understood as an essential element in *relations* of power. (Connolly, 1985 p.371)

Taylor's approach to the relationship between freedom and power can therefore be seen to have relied on the sort of privileging of the subject characteristic of most modern Western political thinking, with its idealisation of autonomy. In contrast to this approach, Foucault's understanding of power is generally understood as rejecting any 'founding subject' whose essential nature power represses or distorts. Although in this chapter I argue that Foucault's break with the subject is not as complete as has often been claimed, he nonetheless did not conceive of power as a wholly negative force undermining the pre-constituted autonomous subject. Rather power was seen by him as productive, as giving rise to the historical relations and discursive practices through which subjects are formed. As with Habermas, Taylor's criticism of Foucault can therefore said to have been based on a misrepresentation of Foucault's approach to power.[213] This rebuttal of the one dimensional conception of power attributed to Foucault by critics such as Habermas and Taylor, however, still leaves us with the task of understanding why Foucault appeared to regard the connection between power and knowledge in the human sciences differently from that which applied in the natural sciences?

A clue to this is provided by further consideration, in the light of the foregoing discussion about the connection between power and freedom, of Foucault's distinction between power and capacity. Patton rightly indicates that for Foucault what distinguished the forces or capacities that act directly on bodies

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[213] For a discussion of Habermas and Honneth misunderstanding of Foucault' approach to power, see Chapter 5 of the current thesis.

and instruments from relations of power is that the latter treat human beings as *acting subjects* rather than merely docile bodies or things. (Patton, 1989 p.271) Thus Foucault could be seen at least in his later works, as having understood freedom (in the sense discussed above) as the 'ontological precondition of politics and ethics'. In doing so he assumed a particular conception of 'the human material upon which power is exercised'. In this Foucault appeared to preserve the modern philosophical acceptance of basic differences in the relations involving the instrumental manipulation of things and the actions of agents or subjects (although he does see these as forming 'blocks' which can 'constitute regulated and concerted systems' or disciplines). (Foucault, 1982 p.218-9) Patton elaborates on this in the following terms:

> This human material is active; it is an entity composed of forces or endowed with certain capacities. It is a subject of power, where this term is understood in its primary sense of capacity to do or become certain things. This conception of the human material may therefore be supposed to amount to a 'thin' conception of the subject of thought and action: whatever else it may be, the human subject is a being endowed with capacities. It is the subject of power, but this power is only realised in and through the diversity of human bodily capacities and forms of subjectivity. (Patton, 1994 p.61)

One of Habermas' principal criticisms of Foucault, that of 'crypto-normativism', focuses on just this 'thin' conception of subjectivity. Habermas attacked Foucault for failing to acknowledge that his writings in effect locate the justification for resistance to power in a form of vitalism based on 'the body's experience of itself' as subjected to the disciplinary force of biopower. (Habermas, 1985 p.285) Similar arguments have been made by feminist writers such as Judith Butler, who comments that in Foucault power becomes the focal point of a 'displaced vitalism', in which 'power, conceived as productive, is the form life takes when it no longer needs to guard itself against death.' (Butler, 1993 p.88) While Foucault's argument concerning the body as constructed by power is complex, it is also in some respects ambiguous. On the one hand he insisted that the body had no ontological independence outside of discourse and power, (Foucault, 1984a p.83, 87-8; Foucault, 1990) yet as Bulter argues, his Nietzschean genealogy posited the body both as a surface or site inscribed by power, and as a set of prediscursive subterranean 'forces' that are 'repressed and transmuted' by such inscription, and which provide the basis of resistance to power. (Butler, 1989 p.601-7) Butler claims that while Foucault criticised Nietzsche's presumption of a life-affirming 'prediscursive instinctuality' (for example, in Discipline and Punish), he nevertheless fell back into employing such a notion in other works (as in 'Nietzsche, Genealogy and History'), sometimes even expressing this as 'the essential and transhistorical precondition of "history".' (Butler, 1989 p.606-7) Similarly, Bryan Turner argues that despite the apparent anti-foundationalism of Foucault's epistemology, his work is

underscored by a 'romanticism ... in which the primitive body, existing before signification, represents a world of innocent enjoyment.'[214] (Turner, 1992 p.53-55) Other commentators, such as Ladelle McWhorter, deny that Foucault saw the body as a natural object standing in opposition to culture - rather it stood in opposition to the philosophical discourse 'that gives us nature/culture dualism' and its associated disputes. McWhorter also points to the influence of Nietzsche's use of the term body, but insists that both Foucault and Nietzsche use this to deny the possibility of any 'sure and singular source of the truth of man', even in the *natural* body.[215] (McWhorter, 1989 p.608-14)

Patton explains the link between Foucault and Nietzsche in a slightly different manner. He argues that Foucault's thin conception of the subject was developed into a 'more robust conception of human being' in later works, especially The Use of Pleasure. (Patton, 1994 p.69) There he points to the discussion of practices of self-regulation (over one's body and sexual relations with others) as evidence of Foucault's acceptance of the notion of autonomy, not only of the individual self, but also in terms of forms of sociality or community.[216] (Patton, 1994 p.65, 67) Autonomy in this sense thus stands in equivalence to power as the 'self-directed use and development of human capacities.' (Patton, 1994 p.68) These capacities derive from a variety of sources - some are dependent on the physical properties of the body as a biological entity, while others are the products of social and institutional interactions. Patton goes further to distinguish a third, interpretative dimension to capacity associated with the Nietzschean notion of will to power. He argues that in Nietzsche the will to power is an affective state involving a 'feedback loop' between the capacity for action itself and a self-conscious experience of successful action as power - involving what Warren describes as the 'self reflective goal of experiencing the self as agent'. (Patton, 1994 p.70; Warren, 1988 p.138)

Drawing on Nietzsche in this way, Patton directs our attention to Foucault's insistence on the way in which structures of domination in contemporary society are characteristically accompanied by acts of resistance. Patton suggests that while this may provide evidence of some minimal capacity for autonomous action by subjects, in order for Foucault to be able to explain why individuals and groups actually experience particular relations of power *as domination*, he must extend his 'thin' conception of human being (as a subject endowed with the capacity for action) to presuppose a 'fuller' or more 'robust' conception of subjectivity that

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[214] See also Turner (1984) p.157-76

[215] See also Bennett (1987)

[216] Patton comments 'there is no reason to expect that such degrees of autonomy will be developed by individuals acting alone rather than in the context of movements for change in certain aspects of social life.'

encompasses a sense of agency, that is, as involving the experience of feelings of power/powerlessness along the lines suggested by Nietzsche. (Patton, 1994 p.70-1)

In drawing this connection between Foucault's later work and the Nietzschean notion of will-to-power, Patton is able to respond to those such as Habermas and Taylor who criticise Foucault for his failure to provide a universal normative basis for evaluating different regimes of power, and hence his inability to explain why it is morally justified to resist domination. As noted previously, one response is the non-normative observation that such power is *in fact* resisted, that is, to say that resistance 'follows from the nature of particular human beings.' (Patton, 1994 p.69) However, Foucault's argument went further by basing the fact of resistance on ontological assumptions regarding the sorts of human capacities that give rise to action, including resistance. Patton's analysis demonstrates not only that autonomy is the 'ontological precondition' for power, but also that an important element in forming the capacity of human beings for such action is the *self-reflexive experience of agency*.

Thus as Patton claims, effective moral values (and presumably other forms of normative evaluation such as what constitutes legitimate knowledge in a particular scientific domain) are therefore reliant on the circumstances and manner in which the self-experience of agency takes place, that is, 'values are internal to types of individual and social being, not independent of them.' (Patton, 1994 p.71) It is in this context that Foucault's references to the need for a 'new economy of power relations' and a 'practice of freedom' must be understood - that is, Foucault was proposing a form of ethics that by definition is incapable of providing the sort of universality demanded by critics such as Habermas. Such an ethic, says Patton, would nevertheless justify resistance to *specific* instances of domination precisely because the practices of liberty that it invokes would be 'internal' to particular forms of subjectivity, and would therefore be dependent on the ways in which individuals and groups experienced agency. (Foucault, 1982; 1988a)

This perhaps could be regarded as a partially effective response to the criticisms of Habermas and Taylor, and indeed, acceptance of such an interpretation is necessary to fully capture the subtlety of Foucault's later work.[217] (Foucault, 1983 p.198-201; 1988c p.13) Nevertheless it could be claimed that Foucault only achieved this by moving away from his earlier goal of writing a history of rationalities not based on the founding act of the subject. In pointing to the Nietzschean foundations of Foucault's notion of agency, Patton's work highlights why Foucault has been vulnerable to the charge of harbouring a vitalism of the primitive body and with making this the transhistorical

[217] This is something that I have argued critics such as Habermas fail to do. See Chapter 5.

precondition of history. Patton's argument implies that the conception of freedom employed in Foucault's later work is fundamentally perspectival, and as such dependent on the ways in which different individuals experience agency and subjectivity. He argues that Foucault clearly saw freedom as 'the ontological precondition of politics and ethics', but goes on to stress that

> this is an historical rather than a transcendental ontology. Freedom here is not the transcendental condition of moral action, as it is for Kant, but rather the contingent historical condition for action upon the actions of others (politics) and action upon the self (ethics). Just as for Foucault political power exists only in the concrete forms of government of conduct, so freedom exists only in the concrete capacities to act of particular agents. (Patton, 1994 p.68)

While it may be conceded the forms of subjectivity invoked by Foucault appeared to lack a singular transcendental quality, given that they are formed by historically contingent regimes of power, Patton's argument does not fully extricate Foucault from the allegation of vitalism. For what lies behind Nietzsche's will to power, and consequently the body as possessing a series of capacities for action which aim at enhancing the experience of agency, is the argument that language and knowledge function as useful tools for survival inasmuch as they allow a practical imposition of order on the chaotic flux of the world.

For Nietzsche consciousness and self-consciousness, and thus the capacity to experience agency, have their origin in the evolutionary development of the human species.[218] In a direct sense then Nietzsche saw agency (and the experience of it - 'the feeling of power') as linked to the vital biological interest of the human species in self-preservation. (Held, 1980 p.156-7; Warren, 1988 p.90-2) At the same time he claimed that the will-to-power is not confined to human beings, but is an essential quality of all life. Nor is life simply a striving for self-preservation: 'Nature is a struggle not to exist but to overcome, to prevail and to triumph, even in defeat ... Nature is ... will-to-power.'[219] (Platt, 1988 p.148-9) Nature for Nietzsche consists of the chaotic 'flux and multiplicity of raw experience' - it is not particularly predisposed to any anthropocentric form of secure cognitive and cultural representation. Nevertheless, the human species inscribes nature with its

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[218] On this see Turner (1984) p.242-4. For an attempt to link Nietzsche's view of the will-to-power, as a general biological feature of life, to the modern ecological perspective, see Hallman (1991). There is an interesting parallel here to the use of Spinoza's notion of conatus by 'deep ecology' theorists such as Naess, who argues that conatus (or 'striving to persevere in oneself or one's being') is more than the urge to survive, but is a striving for an increased power of self-creation and self-development, and as such is an 'urge towards higher levels of freedom (libertas).' See Naess (1985) and (1977).

[219] For Nietzsche, of course, 'man' is the 'crown of nature'.

cultural practices, and in so doing attempts more or less successfully to confer familiarity and continuity to the world. (Warren, 1988 p.47-8) Thus culture (which includes values and knowledge) as a way of constituting and disciplining relations with nature is always historical and perspectival. Warren points out that for Nietzsche 'the conditions of possibility' for such knowledge (and values) are in part 'interests relating to human agency', that is, as involving interests in 'the material, social and cultural worlds as means to and conditions of power organised as subjectivity.' Knowledge and values therefore cannot be extricated from the interest the self has in increasing its 'feeling of power'. (Warren, 1988 p.90-2)

There are notable parallels in the role that these sorts of interests play in the work of Nietzsche and Habermas. Although Habermas criticises Foucault for his Nietzschean inspired 'crypto-normativism', Warren suggests that Habermas' treatment of interests as a positive condition of knowledge, is a 'contemporary equivalent' of Nietzsche's approach ('notwithstanding Habermas' own interpretation of Nietzsche').[220] (Warren, 1988 p.268, note 35) What is clear is that both Nietzsche and Habermas conceive of interests as having their basis in the natural history of the human species, and that these interests are inseparable from human embodiment and sensuous needs. In the early Habermas, these species' interests, which give rise to knowledge, language and values (understood as the achievements of the transcendental subject) are tied to the vital, biological need for self-preservation.[221] (Habermas, 1978, Appendix) A similar argument is developed by Turner when he claims that for Nietzsche 'the nature and functions of knowledge are thus located in the evolutionary development and needs of the species, especially in the necessary features of social communication. Language is a requirement of human survival and is rooted ultimately in the physiological basis of human existence.' (Turner, 1984 p.242-3) Here again, there is a parallel between Nietzsche and Habermas' view of communicative action as a fundamental attribute of the human species.

If as Patton cogently argues, Foucault is to be understood as basing his notion of agency on Nietzsche, then Foucault could be said to base not only his 'thin' conception of subjectivity, but also the later and 'fuller' development of this, on those vital capacities attached to the primitive body that forms the site of signification and cultural inscription. Such a view is consistent, following my

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[220] Habermas' criticisms of Nietzsche (and Horkheimer and Adorno's appropriation of Nietzsche) are discussed at the end of Chapter 1 of the current thesis. See also Turner (1984) for discussion of Nietzsche and Foucault.

[221] See Chapter 3 of the current thesis for discussion of the 'early' Habermas' approach to knowledge constitutive interests. Of course, Habermas insists that while human interests emerged from the human species' natural history, knowledge constitutive interests 'derive both from nature and from the cultural break with nature.' (Habermas, 1978 p.312)

suggestion in the previous chapter, with the way in which Foucault takes the body as the both the target of modern government and the source biopower. Turner is thus correct to emphasise that Foucault's intellectual endeavour is primarily focused on the institutionalisation of the body through 'the demographic (a theory of the population) and the physiological (a theory of the body).' (Turner, 1984 p.159-163) However, need the acceptance of such a reliance on the vitalism of the body be problematic for Foucault's analysis? In itself, probably not, for the most valuable contributions of Foucault's work are not substantially undermined by admitting that the processes of human objectification and subjectification must necessarily operate on some sort of substrate. However, it does lead us to inquire further into the assumptions that underpin Foucault's later approach to power, in order to understand his different treatment of the human and natural sciences.

Foucault's incomplete critique of sovereignty

In the context of the argument developed by Patton and as Foucault (1988a) suggested, the effects of domination need not always be seen as morally objectionable. [222] It merely suggests that individuals have a capacity for autonomous action, and that when this freedom to act is significantly curtailed, this is or at least may be, experienced as loss of autonomy, as domination. Neither the fact that any particular individual's capacity to act has been reduced to a minimum, nor the subsequent experience of this as a loss of freedom by the individual in question means that domination as such is morally wrong unless a further step is taken in the argument to claim that, as a general principle, the autonomy of others *should not* be significantly limited. This, of course, is a key element in much modern political thought, with its dual emphasis on individual autonomy and legitimate political sovereignty. This is precisely the point made by Taylor when he argued that power (he uses this in the sense of power *over*) or domination involves an imposition on the significant interests or purposes of an individual.

Barry Hindess has questioned some of the philosophical assumptions behind Foucault's later attempts to distinguish between power, government and domination. (Hindess, 1996) Hindess argues that from Hobbes and Locke onwards, political reflection on power has been dominated by two distinct conceptions of power - power as simple quantitative capacity to act, and power as legitimate capacity or right, which is dependent on the notion of consent by the subjects over whom such power is exercised. Confusion between these two ideas has been endemic to modern political thought, even among would-be radical critics of power, such as Habermas and Steven Lukes, (Lukes, 1974) who argue

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[222] Foucault uses the example of the asymmetry of power relations involved in education as an example.

for the emancipation of the individual *from* power. (Hindess, 1996 p.1-22) Critical theory carries forward the 'confusion' between these two concepts of power, which are based on two substantially different models of the human subject. Thus despite Habermas' criticisms of earlier critical theorists, he effectively retains their key underlying assumptions such as the ideal of the autonomous, rational individual and the possibility of some form of political community free from the distorting effects of power. (Hindess, 1996 p.94) In this regard suggests Hindess, there is a clear continuity between contemporary critical theory and Locke, in whose work is evident two views of the subject. One emphasises the autonomous, rational individual whose *consent* is necessary for the legitimate exercise of political power, while the other treats the individual as a considerably more malleable entity whose attitudes and hence standards of moral judgment are moulded by processes of social interaction. (Hindess, 1996 p.18, 58-63, 94-5)

It is not necessary to revisit in detail the discussion in earlier chapters of critical theory, other than to acknowledge Hindess' persuasive argument that critical theory, in its purportedly radical treatment of power, fails to break with the preoccupation with sovereignty and right, which Foucault identified as the central problem of modern political theory. Of significance for the discussion here is that in clarifying the shortcomings of critical theory's critique of power, Hindess brings into focus Foucault's own continuing attachment to an underlying vision of individual autonomy. In this context it is useful to cite Hindess' summation of how this notion of autonomy underpins the entire critical theory project. Hindess argues that contemporary critical theorists such as Lukes, Marcuse and Habermas

> base a significant part of their analyses of power on: (1) a model of the individual as a creature of social conditions; (2) an image of the autonomous individual which provides an ideal against which the present can be measured; (3) the claim that such an ideal could be realised in a realm of social existence that is not structured by the illegitimate effects of power. This last presents us with the utopian vision of an idealised civil society whose inhabitants would be precisely the autonomous, rational persons required by the Lockean account of political power. In their different ways ...[these theorists] ... acknowledge the reality of heteronomy - the fact that the attributes and capacities of persons are crucially dependent on social conditions - while retaining the Lockean ideal of the autonomous, rational person. (Hindess, 1996 p.95)

Hindess recognises the radical nature of Foucault's break with the 'Hobbesian' model of sovereign power in that it rejects the standard preoccupation with sovereignty and legitimacy. Yet at the same time, he points to elements in Foucault's work that continued to cling to the 'enduring fictions' of Western political thought. In particular Hindess questions the distinction Foucault made in his later writings between power and domination. If power is co-

extensive with all social relations, and therefore unavoidable, then the normative ideal of a general emancipation from power relations is simply untenable. Of course, as Hindess and Patton note, this did not mean Foucault rejected the notion of a limited 'emancipation' from specific systems of power or from the effects of particular techniques of power. (Hindess, 1996 p.152; Patton, 1989 p.274-6)

In general Foucault expressed a deep distrust of notions of universal emancipation or 'liberation', an attitude linked to his rejection of humanism, and to his concern to understand history as the history of multiple, specific and therefore potentially conflicting *rationalities* of government. (Foucault, 1984b) Paradoxically, from the perspective of traditional political philosophy, the core of these concerns in Foucault's work was the desire not to close off the possibilities of human action and therefore autonomy and freedom. (Foucault, 1988c p.15) In his later work Foucault conceded that 'liberation' could be the necessary precondition for the practice of liberty, but he defined the applicability of these terms in a restricted manner. First, he suggested 'liberation' may be necessary where a state of domination exists, that is, where the relations of power have become fixed and 'congealed'. Second, the 'liberation' must be understood as limited to those specific factors that have become the object of such domination. In other words for Foucault 'liberation' involved freeing up existing (or creating new) relationships of power, not dissolving them *per se*. This was the freeing up of the capacity of particular agents to act (*power to)*, and hence involves the transformation of rigidified relations (states of domination) towards the dynamic '*agonism*' that exists between autonomous agents in relations of power (and resistance) proper.[223]

Foucault rejected the sorts of universal emancipation espoused by humanists such as Taylor and the critical theorists, because rather than removing restrictions on the free play of relations of power, their view of liberation was based on a foundational human subject which had become suppressed or alienated. Liberation in this context referred to the restoration of this repressed subject to its genuine form. (Foucault, 1988a p.2-3) By contrast, Foucault's critique of humanism was based on the argument that it was through historically contingent discursive and disciplinary practices that this very 'idea or model of humanity was developed, and now this idea of man has become normative, self-evident and is supposed to be universal.' The representation of certain modes of subjectivity as universal or transcendental had to be rejected precisely because it 'presents a certain form of our ethics as a universal model for any kind of freedom', and in doing so forecloses other possibilities for freedom. (Foucault, 1988c p.15)

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[223] 'Liberation opens up new relationships of power, which have to be controlled by practices of liberty.' (Foucault, 1988a p.4)

Given Foucault's rejection of the notion of freedom as involving the liberation of an essential subjectivity from the distortions imposed by power, in what alternative sense can freedom be understood? Ian Hacking points to what he describes as Foucault's 'extreme nominalism', which denies any pre-conceptual mode of being and insists that all aspects of the social, including subjectivity itself, must be seen as historically contingent. (Hacking, 1986a p.29, 37) Elsewhere he develops this further to describe how a theory of 'dynamic nominalism' relates to the notion of the individual person. Intentional action, says Hacking, is action 'under a description', that is, deliberate human action is dependent on the ways in which we describe those actions. Consequently, new modes of description create new modes of being and new possibilities for intentional action. Hacking suggests that each category of personhood has its own history, which can be understood as resulting from two 'vectors of labelling' - one from above, imposed by the discourse of scientific disciplines and dividing practices, the other from below, defining the autonomous behaviour of individuals. (Hacking, 1986b p.231-5)

Two possibilities for freedom arise from this. Firstly, the potential for different types of subjectivity is in a basic ontological sense indeterminate and open, although actual forms will be the product of historically derived relations of power relations that are open to change. Secondly, while the power relations and 'regimes of truth' will tend, through various objectifying processes, towards normalisation of the individual, the thrust from below of what Foucault called anonymous, subjugated knowledge provides a resistance to normalisation and disciplinary practices. (Foucault, 1980e p.81-84) As Patton comments, this 'spectrum of existing forms of individuality' defines the possibilities for subjectivity at any particular historical juncture. Thus Foucault's genealogical method inevitably finds itself in a certain dynamic tension. A tension that on the one hand presents a form of historical *a priori* of what is possible within a particular historical space, while at the same time opening up games of truth to radical questioning, exposing received forms of subjectivity as historically contingent 'straightjackets of identity' that are not immutable or inevitable, but imposed and arbitrary. (Patton, 1989) It is this tension that Foucault is referring to in his later work when he talks of the ethos of the 'care of the self' as a practice of liberty and directs his attention to 'the problem of the relationships between subject and games of truth'. In so doing he drew a contrast with his earlier work on power,[224] and acknowledged this involved a shift of emphasis from a concern with the relationship between knowledge and these coercive or objectifying practices towards the 'practices of self-formation of the subject'. (Foucault, 1988a p.2) In Hacking's terms this could be seen as a shift between the 'two vectors of

[224] Where the emphasis was on 'coercive practices' such as psychiatry and the penal system, and 'theoretical or scientific games', such as 'the analysis of language and of the living being' (Foucault, 1988a p.2)

labelling' to an emphasis on the one 'from below' which is concerned with reflexively defining the autonomous behaviour of the individual.

The difficulty Hindess points to in this shift is that Foucault appeared to suggest 'not simply that domination will in fact be resisted, but also that it *should* be kept to a minimum' (Hindess, 1996 p.154). In other words, Foucault appeared to shift from the recognition of resistance as an effect of certain types of power relations, to advancing what appeared to be a universalised normative injunction. Thus while at a methodological level Foucault seemed to reject notions of generalised emancipation and universal ethical standards, Hindess suggests that in his later remarks on both the critical function of philosophy and on the nature of freedom, he could be regarded as resurrecting some of the central concerns of critical theory, particularly the idealisation of autonomy. Hindess illustrates this by contrasting Foucault's earlier (1971) Nietzschean account of history as 'the endlessly repeated play of dominations (in which) humanity installs each of its violences in a system of rules and thus proceeds from domination to domination', (Foucault, 1984a p.85) with the view put forward in his last interview in 1984, where the critical function of philosophy is identified as 'the challenging of *all phenomena of domination* at whatever level or under whatever form they present themselves'. (Foucault, 1988a)

Foucault linked this critical role for philosophy to the 'Socratic imperative' for the individual to 'ground yourself in liberty, through the mastery of the self.' (Foucault, 1988a p.20) This is so because it is *free individuals* who are engaged in relations of power (or 'strategic games of liberty') with each other, which Foucault contrasts with states of domination ('which are what we ordinarily call power') and political power ('understood of course, as a state of domination'). (Foucault, 1988a p.19-20) Thus less than six months before his death, Foucault outlined his project in terms that very clearly placed the notion of the freedom and autonomy of the subject at the centre of his work:

> I do not think that the only point of possible resistance to political power - understood of course, as a state of domination - lies in the relationship of self to self. I say that governmentality implies the relationship of self to self, which means exactly that, in the idea of governmentality, I am aiming at the totality of practices, by which one can constitute, define, organise, instrumentalise the strategies which individuals in their liberty can have in regard to each other. It is free individuals who try to control, to determine, to delimit the liberty of others and, in order to do that, they dispose of certain instruments to govern others. That rests indeed on freedom, on the relationship of self to self and the relationship to the other. (Foucault, 1988a p.20)

This move, which allows Foucault to distinguish between domination and 'strategic games of power between liberties', is seen by Hindess as invoking an

idealised conception of community in which domination is kept to a minimum, and thus as promoting yet another 'version of the utopian critique of power' that Foucault's own work in other respects had served to undermine. (Hindess, 1996 p.156) Hindess suggests that if we accept Foucault's view (and he clearly thinks we should) that the human subject is constituted by the effects of power, then there are no grounds for a normative condemnation of domination in *general*. How can we accept the productivity of power in the formation of human capacities and at the same time condemn the role subjectification and domination play in this process? In particular Hindess draws on the argument developed by Nietzsche concerning the source of 'responsibility' or autonomy in the modern individual. Nietzsche examined how the 'sovereign individual' ('the man who has his own independence, protracted will and the right to make promises') comes into being historically. (Nietzsche, 1989) What Nietzsche deals with is precisely the genealogy of the modern subject of power, the 'free individual' that Foucault invokes as engaging in practices of liberty.[225]

Nietzsche's claim was that the very condition of autonomy, expressed through the capacity to take *sovereign responsibility* for one's actions ('the right to make promises') is the result of a long history of moral discipline and social regimentation in which human beings are made 'to a certain degree necessary, uniform, like among like, regular, and consequently calculable' (Nietzsche, 1989 p.58-9) - the very point Foucault himself made time and again. Thus, as a crucial component of the historical processes responsible for the formation of modern subjectivity, domination must be understood as 'an indispensable condition of liberty - or at least the kinds of liberty that both we and Nietzsche have learned to desire. (Hindess, 1996 p.155)

Hindess suggests that to be consistent, Foucault's analysis of the productivity of power relations must also recognise that some degree of domination and subjectification are *necessary* for the existence of organised social structures and institutions. Consequently, as both Nietzsche and Hobbes argued, these are also necessary for the forms of liberty made possible by 'organised social existence'. (Hindess, 1996 p.157) A consistent application of Foucault's own analysis would therefore require that while it would be a sociological fact that particular instances of domination would be resisted, there could be no transcendental normative grounds on which to condemn domination in general. That Foucault in his later works appeared to repeatedly to do just this indicates he neglected his own methodological prescription that criticism should not be practiced as a 'search for formal structures with universal value', but rather as specific historical

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[225] In rebuffing Habermas' utopian notion of power free communication, Foucault suggested that it was necessary to 'ground oneself in liberty', that is, 'to give one's self the rules of law, the techniques of management, ... and the ethos, the practice of self that would allow ... games of power to be played with a minimum of domination.' (Foucault, 1988a p.8)

investigations into the events and processes responsible for producing the modern subject in its various forms. This demanded that philosophical analysis must eschew 'all projects that claim to be global or radical'. (Foucault, 1991e p.45-6)

According to Hindess, the basis of Foucault's apparent inconsistency on this question lies in his incomplete critique of sovereignty. He failed to fully disengage his analysis from that pervasive 'modern obsession with the idea of the person as autonomous agent, and consequently, with the idea that a community of such persons can, and should, be governed by consent of its members.' (Hindess, 1996 p.157) This was implicit in Foucault's treatment of domination as something that should be avoided or minimised as far as possible because it undermines the liberty of the individual and leads to 'congealed' or rigid relations of power. Here Foucault returned to a theme familiar in modern political philosophy when he expressed a concern not only for the repressive effect on the liberty of those *subjected* to domination, but also the view that domination in some way corrupts those exercising power (*domination*). This is made clear when he suggested that 'if you care for yourself correctly ... then you cannot *abuse* your power over others.' (Foucault, 1988a p.18)

While Foucault (and others) have focused on elaborating the genealogy of the modern individual, much less has been done to understand the ways in which power and domination constitute the community within which such individuals are formed. (Hindess, 1996 p.158) Thus while the differentiation of domination from power can serve useful analytical or descriptive purposes, Foucault's reasons for privileging the freedom associated with power relations proper must be called into question if his own arguments about the productive nature of the disciplinary processes are to be taken seriously. In his analysis Hindess concludes that Foucault's criticism of political sovereignty did not go far enough. Not only do we need, as Foucault insisted, a political philosophy that is not built around the problem of sovereignty, we also need to free ourselves from that other constitutive fiction of modern political thought - that of political community. A full consideration of this problem is beyond the scope of the present thesis. Nevertheless, Hindess' analysis does suggest an answer to the question of why Foucault made a distinction between capacities exerted over things and relations of power among acting human subjects, and why the natural sciences, which take as their object the study of non-human things, were seen by him as capable of detaching themselves from relations of power.

My argument here is that Foucault's 'privileging' of the natural sciences should be seen as linked directly to his underlying philosophical concern with *autonomy* as a fundamental feature of human nature. As suggested earlier in this chapter, Foucault's analysis appears to have rested on a vitalism of human bodily capacities (what Patton terms a thin conception of the subject of thought and action), but more significantly it ontologically characterised human nature as the capacity for agency, a move which was tied to a particular idealisation of

individual autonomy. Thomas Wartenberg has argued that Foucault 'attributes to power the structure of human agency - that is, the capability of performing actions with strategic intent' and that this amounts to posing power 'as a quasi-subject', a move which obscures the actual processes involved in power relationships. According to Wartenberg, despite his insights into the mechanisms of social domination, Foucault thus effectively relied on a metaphysical positing of a 'supra-human subject ... as necessary for explaining the nature of human social development.' (Wartenberg, 1990 p.137-9) While Wartenberg over-states the degree to which Foucault was guilty of hypostasising power, there was clearly in Foucault's later work an underlying Nietzschean notion of human nature that lent itself to an idealisation or affirmation of individual autonomy.

Rouse: the critique of epistemic sovereignty

The argument that Foucault's critique of sovereignty does not go far enough has been raised in a different way by Joseph Rouse. [226] His analysis is important in the context of the present chapter because he is one of the few scholars to specifically consider how Foucault's work applies to the natural sciences. [227] Rouse (1987; 1991; 1993; 1994) claims that a critique of sovereignty analogous to that put forward by Foucault in relation to political theory can be developed in epistemology and philosophy of the natural sciences.

A key element of Foucault's criticism of the concept of political sovereignty was that it obscured the ways in which power actually operates in modern societies. Theories of sovereignty rely one-sidedly on the politico-juridical model of power as repressive and prohibitive, and neglect the dispersed sources of power (its 'microphysics') and its deployment outside the frameworks of the state.[228] In this regard Rouse points to Foucault's claim that the principle of sovereignty in political theory was increasingly separated from 'any real political location' and instead was turned into an 'analytic' or 'theoretical' construct against which political practice is assessed. (Rouse, 1993 p.145; 1994 p.101) Foucault's concern then was that political criticism based on the concepts of sovereignty and right misrepresented how power operates, but also that it 'dangerously misunderstands its own positioning' by failing to recognise the fictitious nature of the rational consent that purportedly formed the ultimate foundation of political sovereignty. That is, the modern institutions and practices of sovereignty are not the source of power but rather were constituted by the sorts of disciplinary practices that lay

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[226] A version of this section of the Chapter was previously published in Rutherford (1994a).

[227] Other major works to consider this include Kusch (1991) and Gutting (1989).

[228] See Chapters 5 and 6 respectively of the current thesis for detailed discussion of these points. Foucault most clearly develops his critique of sovereignty in his lectures published in the Colin Gordon (1980b) collection and Foucault (1990)

outside of the political realm of law and right. In rejecting political criticism based on rights, Foucault was objecting to any attempt to endow historically specific political positions (and in particular, French intellectual Marxism) with the standpoint of a generalised or transcendental *epistemic sovereignty*. [229] (Rouse, 1993 p.144-9; 1994 p.101-4) While Foucault does not use this term, Rouse argues that it is not difficult to discern a fairly clear parallel within epistemology to the concern with sovereignty evident in political thought.

> All of the central issues of political sovereignty are reproduced in epistemology: the constitution of a unitary regime, based upon legitimacy through law, established from an impartial standpoint above particular conflicts, and enforced through discontinuous interventions that aim to suppress illegitimacy. The problematic of epistemic sovereignty is fundamentally located in the standard contrast between knowledge and belief or assertion. ... Knowledge is a unified (or constitently unifiable) network of statements that can be extracted from the welter of confused and conflicting contenders and legitimated in accord with rules of rational method, the epistemic surrogate of law. Here is where the figure of the epistemic sovereign is theoretically important. Sovereignty need not be located in any actual sovereign knower, any more than political sovereignty requires a monarch. But just as the sovereign power must be one that *could* consistently be embodied in a single will, sovereign knowledge must be consistently representable in a single coherent propositional system. (Rouse, 1993 p.147)

The objections Foucault raised with political sovereignty can be seen to apply to epistemic sovereignty as a view of knowledge that tends to ignore the local and multiple 'micropractices' that produce knowledge and its objects. Foucault's work makes it clear that relations of power and knowledge constitute both the 'knowing subject and the truths known'. (Rouse, 1994 p.103) Just as Foucault's critique of sovereignty sought to overcome the theoretical privileging of sovereignty and law in the analysis of power, his genealogical investigations were an 'attempt to emancipate historical knowledges (from) the coercion of a theoretical, unitary, formal, and scientific discourse' which 'aims to inscribe knowledges in the hierarchical order of power associated with science'. (Foucault, 1980e p.85) Given this, it is reasonable to suggest that while Foucault did not develop a critique of the natural sciences in the same way as he did for the human sciences, it is nevertheless possible to find a strong parallel between the ways in which natural scientific knowledge is produced and the sorts of disciplinary practices Foucault identified in the production of power/knowledge in the human sciences.

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[229] On Foucault's criticism of Marxism, see Foucault (1980e) p.84-8.

Rouse argues that despite Foucault's own apparent reluctance to apply his approach to the established natural sciences, his genealogies, by problematising the notion of an essential human subjectivity, also challenge the traditional concepts of representation and action that ground the distinction between the natural and human sciences. (Rouse, 1993 p.138-9) Rouse aptly points out that any

> strong epistemic or political distinction between nature and society would clearly be subject to the central motivating question of Foucault's work: 'in what is given to us as universal, necessary, obligatory, what place is occupied by whatever is singular, contingent, and the product of arbitrary constraints?' (Rouse, 1993 p.138-9)

He therefore suggests the need to broaden Foucault's notion of power beyond interaction conceived simply as relations between human agents, to one that encompasses the ways in which the configuration of technical practices and material technologies help structure specific alignments of power. (Rouse, 1991 p.660) As with the human sciences, scientific knowledge of new phenomena in the natural world (including ecological processes and entities such as global warming) alters the strategic alignments of power relations within society. Both the natural and human sciences rely on developing historically new practices of surveillance which serve to describe, partition, measure, classify and refine the behaviour and properties of their objects of study. New domains of scientific expertise come into existence through postulating new objects of knowledge *and* by developing new techniques for measuring, manipulating and monitoring these new entities. The extension of knowledge and its associated material technologies acts to discipline and control the action-environment of social agents. On this account natural scientific knowledge cannot be separated from power, for knowledge is embodied in the skills, techniques and machines which are integral to scientific activity. (Rouse, 1987; 1991) Conceptual skills and material techniques, which arise from specific alignments of capacities and power at the local or micro-level of the laboratory and within particular technical discourses (such as computer models) are extended *outside* the laboratory and mediate the way in which the world is produced, reproduced and structured. That is, 'power relations require not only keeping other human agents in line, but also a reliable alignment of the physical environment.' (Rouse, 1991 p.659) Foucault suggested something similar when he discussed the 'paradox' of relations of capacity and power. In that context he said that 'control over things is mediated by relations with others' but he maintained the importance of analytically separating three axes or 'practical systems' of critique: those of knowledge, power and ethics. (Foucault, 1984b p.48-9)

Some of the key features that Foucault identified with power relations in the social field can be found in the exercise of capacities over things. In particular the notion of surveillance with its practices of examination, recording and

normalising classification was central to Foucault's understanding of biopower (both as anatomo-politics and as biopolitics), and this finds an obvious parallel in the objectifying practices of the natural sciences. Indeed, as mentioned above, Foucault points to the common origin of the human and natural sciences in the 'terrible power' of the investigatory technique. (Foucault, 1979b p.224-6) In Foucault's work this disciplinary impetus, in which people are treated as docile bodies, was supplemented with an emphasis on the productive character of power. This productive dimension was connected by Foucault, via the technique of the confession, to the self-constituting activities of *speaking* subjects compelled 'to speak the truth' of the self. (Foucault, 1982 p.208) [230] The production of the truth of the self depends on the 'decipherment of what is said' by the expert as confessor. Confession is primarily a procedure in which particular sorts of signs are elicited from the subject and interpreted by experts, and it is only through such a process of interpretation that truth is 'scientifically validated'.

In his discussion of the formation of modern sexuality Foucault thus pointed to the interdependence between procedures of confession and 'scientific discursivity', and argued that in making the truths of the human sciences (particularly those of sexuality) into signs dependent on the 'hermeneutic function' of the expert, it became possible for the procedures of confession to become part of 'the regular formation of scientific discourse.' (Foucault, 1990 p.64-7) Here Foucault restricted his comments to the human sciences. Rouse however argues that it is not just the speaking human subject that is 'constrained to produce signs'. The natural sciences too abound with countless ways in which *things* are also forced to speak, that is, emit signs - as in the human sciences, the objects of investigation in natural sciences do not remain silent and docile. (Rouse, 1987 p.220) Indeed, most if not all of the entities of the natural sciences are only accessible through signs produced by various techniques, equipment, methods and models, the 'disclosures' of which are taken as genuine or real only within the 'authoritative interpretative constraints that distinguish data from artefacts or noise.' (Rouse, 1993 p.141) [231] What Rouse has argued then is that the signs extracted from things may be as important in producing *political* effects as those elicited from speaking subjects. (Rouse, 1987 p.220)

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[230] See also Rouse (1987) p.218 and (1993) p.140.

[231] Rouse cites as examples of techniques used to incite the production of signs such procedures as 'radioactive labelling, cloud and bubble chambers, x-ray crystallography, and various forms of chromatography, spectroscopy, microscopy, and telescopy'. To this could be added the techniques of the environmental sciences, such as general circulation models of the global atmosphere, and even concepts such as 'ecosystem' and 'biodiversity' as these are dependent on forces and entities such as trophic levels and genes which are themselves only accessible through the signs emitted by similar sorts of instruments and techniques referred to by Rouse. I have elaborated on this elsewhere. See Rutherford, (1994a; 1997a).

When this argument is considered in the context of the production of scientific truths in ecological discourse its strength is readily apparent. For example, some parallels can be drawn here with Beck's analysis of the role of contemporary science in the systemic production of ecological 'mega-hazards'. As discussed in Chapter 4, Beck demonstrates that what constitutes an ecological risk, and the way in which the consequent environmental and health hazards are distributed, are discursively defined. The sorts of global ecological hazards Beck is concerned with, such as radiation contamination and depletion of the stratospheric ozone layer, are not readily visible or perceptible in unmediated every-day experience. Rather, ecological risks only come into existence through the objectifying medium of expert judgment, that is, these sorts of hazards are not things of simple experience but require the interpretation of scientific theories and intervention of measuring instruments 'in order to become visible or interpretable as hazards at all.' (Beck, 1992b p.27) [232] Beck suggests that contemporary ecological and technological hazards are characterised by their invisibility to non-expert experience. Such risks

> are based on *causal interpretations*, and thus initially only exist in terms of the *knowledge* about them. They can thus be changed, magnified, dramatised or minimised within knowledge, and to that extent they are particularly *open to social definition and construction*. (Beck, 1992b p.22-3)

One consequence of this is that the victims of technologically produced hazards are rendered 'incompetent in matters of their own affliction', with the power to define hazards and judge exposure to risks increasingly restricted to expert 'external knowledge producers'. (Beck, 1992a p.97-123; 1992b p.53-5)

Rouse argues that while knowledge, in this case that produced by the natural sciences, is not equivalent to power, nevertheless it cannot be considered in isolation from the social field in which it exists. Knowledge includes not only propositional statements (in Foucault's usage *connaissances*) but also objects, instruments, skills, and various social networks. In themselves none of these constitute the discursive field of knowledge (what Foucault termed *savior*). Scientific statements only count as knowledge by virtue of their actual use, that is, in terms of their practical deployment or alignment with other heterogeneous elements; to conceive of scientific knowledge as a stable and 'distinct *object* domain' overlooks the dynamic interconnection between knowledge and other social and material resources. (Rouse, 1994 p.110-1) [233] This of course is

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[232] There is a clear parallel here with Habermas' treatment of 'objective nature' as that which can only be made available as an object of possible knowledge through the objectifying processes of modern science. See Chapter 3 of present thesis for discussion of Habermas on this.

[233] Hence Rouse takes 'the "field" within which scientific claims acquire significance and justification to include more than a web of belief: skills and techniques, instruments and

consistent with Foucault's approach to knowledge in the human sciences. (Foucault, 1990 p.93-4) As with Foucault's view of the human sciences, a crucial element of Rouse's analysis of natural science is his emphasis on the diverse sources of these localised, heterogeneous elements. In line with Rouse's argument against the possibility of epistemic sovereignty, scientific knowledge production must be understood as a series of historical practices the subtlety and detail of which cannot be captured by generalisations about 'scientific reason'. Nor can this be captured by generalisations about the degree of formalisation, as Foucault tended to suggest in his early archaeological work. (Foucault, 1972)

Similarly, the sorts of authoritative interpretation referred to by Foucault as central to the human sciences is also exercised in the natural sciences. As with the human sciences, this also occurs in quite specific socio-historical circumstances with numerous, highly *localised* origins - what Rouse terms laboratory 'microworlds'. Accordingly, scientific concepts and theories, such as genes, retroviruses and global climate change 'only become possible objects of knowledge or discourse within ... a complex practical field, shaped by the availability of equipment, and subtle technical and theoretical skills.' (Rouse, 1991 p.660) In other words, science depends as much on creating and mobilising technical capacities, associated with instruments, machines, tests, protocols etc, as it does on theory construction.[234] Indeed, this approach implies that the investigatory practices carried out in the laboratory (and its analogues in field studies) are far more crucial than is generally suggested by philosophical studies of science, which treat science primarily as a theoretical-discursive activity.

This is a criticism that can also be said to apply to Foucault's treatment of the natural sciences. [235] Drawing on the work of Bruno Latour[236], Rouse emphasises that a key feature of natural science is the ability to construct new phenomena within the laboratory or other experimental situation. [237] What makes science

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material systems (including networks of manufacture and supply), resource availability (money and facilities, but also staff, information, an audience, etc), institutional structures, relevance to other social practices and political concerns and much more.' (Rouse, 1991 p.662-3)

[234] Rose and Miller (1992) develop a substantially similar approach. However their focus is on the role of the expertise of the social sciences. See Chapter 6 in the current thesis for a more detailed discussion of this.

[235] At least in works such as Foucault (1970; 1972).

[236] The work of Latour is discussed in the next chapter. Rose and Miller also draw on Latour, particularly for the notion of 'action at a distance' which they employ to explain the modes of liberal and neo-liberal governmentality which rely heavily on various forms of professional expertise for the shaping of conduct outside of the formal institutions of state rule. See Rose and Miller (1992); Rose (1993).

[237] Here Rouse draws on Ian Hacking's definition of phenomenon: 'By 'phenomenon' Hacking means a manifest regularity in the natural world. It is not a private sensation but a public event

powerful is precisely its capacity to structure the world outside the laboratory. Yet this capacity is not simply the ability to transfer the phenomena from the constructed world of the laboratory to the outside world. More fundamentally it is the ability to transfer the laboratory conditions themselves into the outside world, a task which characteristically necessitates extending the materials and techniques that 'made possible the disclosure and tracking of laboratory phenomena' in the first place. (Rouse, 1987 p.101; 1993 p.139-43)

The principal achievement of science is its capacity to create new phenomena. Science is more than simply a theoretical-discursive activity, but it is also more than the simple discovery of facts through empirical observation. Rouse points to the inherent opportunism of the natural sciences - science is a highly practical activity in which the direction of research (and hence the type of knowledge produced) is to a considerable degree shaped by the techniques and instrumentation available. The capacity of scientists to manipulate instruments and experimental apparatus is as much a *practical* art as *theoretical* representation. Thus experimentation involves much more than the testing of the adequacy of prior theorising against observed facts. Rather it

> opens new domains for investigation, refines them to make them suitable for theoretical reflection and provides a practical grasp of that domain as a resource. The creation of new phenomena, and scientists' practical understanding of the instrumental context of the laboratory within which this creation occurs, cannot be easily subordinated to a theory-dominant picture of how science develops. (Rouse, 1987 p. 100-1) [238]

This approach brings into focus the importance of the non-discursive practices as well as those discursive-theoretical elements that are generally taken to characterise the natural sciences. It forces us to pay attention to the ways in

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that commands our attention. What distinguishes a phenomenon are its clarity and reliability. Phenomena are clearly discernible, and the *circumstances* of their occurrence (although not always their causes or their most adequate description) must be well understood. The clarity of phenomena is to be contrasted to the complexity, the confused muddle, of most events in the world. In the language of information theory, phenomena have a high signal-to-noise ratio. But in this sense of the word there are comparatively few phenomena in nature. Hacking cites the pre-eminence of astronomy as a source of manifest regularity... A few chemical reactions and changes of state might also be cited ... But generally nature presents us with a blooming, buzzing confusion ... An empirical science dependent upon evident regularities in nature will very quickly encounter irreducible local idiosyncrasies. The objects of such a science would be far too complex for any systematic investigation stemming from observation, however careful. We tend to say too many factors are involved for any of them to be clearly seen, although, as Hacking notes, this can be said only in retrospect, when those 'factors' have been distinguished, isolated and analysed. Before that there is just complexity, and the 'factors' from which it supposedly results do not exist.' (Rouse, 1987 p.99; Hacking, 1983)

[238] For more detailed illustrations of this see Rouse (1987) p.69-126; also Mulkay (1979) p.63-95 and Woolgar and Latour (1979).

which technical resources (instruments and techniques) are employed in the construction of phenomena in the experimental settings (laboratory microworlds). It also requires that we further consider the ways in which these phenomena are mobilised and deployed beyond their initial local settings and transferred into the wider society. Central to this approach is the understanding that laboratory microworlds are analogues in the natural sciences of the disciplinary and normalising locales (prisons, clinics, etc) dealt with in Foucault's consideration of the human sciences.

Conclusion

The arguments for regarding the natural sciences in this way are considered further in the next chapter, where I discuss the work of Bruno Latour and actor network theory. However, it can be seen that it is possible to develop a detailed and highly plausible application of Foucault's approach to understand how the natural sciences are enmeshed in strategies of power and knowledge. (Rouse, 1987 p.209-47) The claim that Foucault's critique of political sovereignty can be broadened out in a theoretically consistent manner to a critique of *epistemic sovereignty in general* and the natural sciences in particular, amounts to an immanent critique of Foucault on this count. If it were simply a case of acknowledging Foucault did not develop his ideas in relation to the natural sciences because his primary intellectual (and political) interests lay elsewhere, then the sorts of comments made here could be seen as an extension of Foucault's work rather than as a critique. However, when these arguments regarding epistemic sovereignty are taken against the background of Hindess' comments regarding Foucault's incomplete critique of political sovereignty, their broader critical nature becomes apparent.

To reiterate, Foucault's preparedness to treat the natural sciences in a manner different from the human sciences - by maintaining that the former are able to detach or distance themselves from relations of social power - accepts that there are basic differences between the objects of these different sciences. Hence his distinction between capacities over things and relations of power between active subjects. As I have argued, this distinction, which is perfectly consistent with the main currents of Western philosophical thinking, can be traced to a philosophical commitment to autonomy and the capacity for agency as the defining characteristic of the human subject.

Rouse's approach to this issue draws on the work of the French sociologist of science Bruno Latour in significant ways.[239] Latour's criticism of the 'modern

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[239] I have already noted in Chapter 6 that Rose and Miller's work on neo-liberal modes of governmentality draws on Latour's notion of 'action at a distance'. See Rose and Miller (1992).

constitution' of political philosophy and sociology argues that these critical enterprises are based on the failed attempt to rigidly separate nature and society. Latour is also critical of Foucault, particularly of his acceptance of the 'the solidity of the natural sciences'. The argument that the sources of power cut across the subject/nature divide is taken up in more detail the next chapter.

Chapter 8

Latour and actor network theory.

Introduction

The preceding chapter examined the connection between Foucault's willingness to see the natural sciences as able to detach themselves from relations of power and knowledge, something that he regarded as impossible in the human sciences. This attitude was considered in the context of what I described as Foucault's incomplete critique of sovereignty. That chapter concluded by suggesting that to be consistent with the tasks he set for his own project, Foucault's criticism of political sovereignty needed to be carried further into a rejection of all forms of *epistemic* sovereignty.

The argument that Foucault's notion of power can be developed to deal with the natural sciences is pursued further in current chapter. In doing this I draw on the work of the French sociologist of science, Bruno Latour. In particular, I consider how the distinction between the 'social' and the 'natural' is called into question by a broader critique of epistemic sovereignty. Building on this, I explore the compatibility of the work of Latour and actor network theory with that of Foucault. I suggest that the actor network theory approach can provide an understanding of power and representation in the natural sciences that in key respects is not inconsistent with Foucault's general approach to such questions.

Foucault's approach to the separation of power in the social and natural sciences is problematic and open to challenge. As I noted in the previous chapter, Rouse's work draws on that of Bruno Latour, and it is to the work of Latour, Michel Callon and others associated with 'actor network theory' that I now turn. As suggested in the preceding discussion, if power is to be considered as a relationship (or set of relationships) which is not purely a property of the human subject or agent, then the importance of non-human material entities, including technical resources in understanding power in modern society must be considered in a different light. Actor network theory, and in particular the work of Latour and Callon, promises to help in providing the conceptual approach to overcome the sorts of difficulties identified in the preceding chapter. Indeed, several commentators have alluded to areas of similarity between the general approach to

power adopted by Foucault and that found in actor network theory.[240] In the first part of this chapter I set out some of the key elements of actor network theory, noting in the process the points of similarity with Foucault, before considering in the subsequent parts the points of divergence between the two.

Actor network theory

Actor network theory originated in attempts by sociologists of science to explain, contrary to the prevailing approaches in philosophy of science, how science was 'really done', and to understand how science and technology interacted to impact on society outside the narrow confines of the laboratory. It thus emerged as a critique of other theories or models of science, and in dialogue with other sociologically informed approaches to the relationship between scientific work and the broader society. [241] As such, its early development appears to have occurred largely separate from the central philosophical and sociological debates on power and social theory in which, in recent decades, the work of Foucault has been enmeshed. [242] This is not to suggest that the predominantly European members of the actor network theory 'school' were unaware of the potential intersection of their work with the problems and approaches found in Foucault's work. [243] In fact there is evidence that this link is recognised, albeit often only as a background commentary in the footnotes.

An interesting footnote to an article by Latour (1986) provides a clear example of this is. In that article, Latour criticises sociological theory for the reifying use of notions such as 'society' and 'power' to explain the apparent stability of social relationships. He argues instead for an approach that understands the 'stability' of macro-social structures in terms of the performative nature of micro-relations of power. His analysis parallels that of Foucault in emphasising that macro social structures are the product of the sorts of constant 'agonistic' relations of power at the micro or local level that Foucault discussed in works such as *The Subject and Power* and Power/Knowledge.[244]

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[240] See for example Law (1991a) p.169 and (1997) p.3; Kusch (1991) p.190-191; Ward (1994) p.91; Dean (1998a) p.191, 197

[241] Most notably the Edinburgh School of science studies represented in the work of such researchers as Barry Barnes and David Bloor.

[242] While this development was separate from these debates, it was not in ignorance of them - in particular see Barry Barnes (1988) substantial work on power.

[243] Bruno Latour and Michel Callon, arguably the most influential actor network theorists, are of course both French.

[244] See in particular Foucault, (1982), (1980d) and (1980e).

Latour however added a significant dimension to his analysis that was not adequately dealt with by Foucault, by arguing that stable social institutions[245] always necessarily involve the mobilisation of heterogeneous 'extrasomatic resources' in order to impose and enforce the definitions of particular actors. Furthermore says Latour, the only way to understand such social stability is through examining how power is exerted locally, but that this must also include understanding how non-human and technological resources have been mobilised by actors at the micro-level in conjunction with social elements. (Latour, 1986 p.277) Latour's reference to Foucault occurs against the background of his explanation of this argument, as the final footnote to his paper. It reads in full:

> This is in effect the same result obtained by Michel Foucault [246] when he dissolved the notion of power held by the powerful in favour of micropowers diffused through the many technologies to discipline and keep in line. *It is simply an expansion of Foucault's notion to the many techniques employed in machines and the hard sciences*. (Latour, 1986 p.279 emphasis added)

Considered in the context of my discussion of Rouse in the previous chapter there are good reasons to accept Latour's claim that his approach is a logical development of Foucault's analysis. However, before evaluating the similarities and differences between Foucault and actor network theory in more detail, it is first necessary to examine the key propositions that underpin actor network theory.

According to Callon's explanation of the 'translation model' of science adopted by actor network theory, the prime objective of science is to produce statements, which he qualifies by stressing the importance of both the process by which such statements are made, and the role of non-propositional elements in their production. Statements in turn make up *translation chains* in that all scientific statements refer to other statements, objects and other 'time spaces', which are condensed and thus made available. Translation chains 'combine heterogeneous elements of which the most important are statements, technical devices and tacit skills that can rightly be called embodied skills.' (Callon, 1995 p.50) Relationships between these heterogeneous elements are built through what Latour called inscriptions - written traces produced in reports, laboratory notes, graphic displays, data tables etc. The important point here is that contrary to those models of science which assume a fundamental division between experimental instruments and observational statements, the translation model sees simply a

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[245] Foucault argued that such stable institutions, resulted from what he called states of domination 'when stable mechanisms replace the free play of antagonistic reactions'. (Foucault, 1982 p.225-6).

[246] The reference here is to Discipline and Punish.

range of inscriptions which vary in their degree of sophistication and organising capacity.[247]

Callon explicitly draws a parallel between the approach of Foucault and Latour, this time when he argues that 'Writing devices are important in all scientific fields and beyond. For example, Foucault ... analyses the hospital as a device that places the individual in a "network of writing".' (Callon, 1995 p.51) Developing this analysis further, Callon emphasises that, for actor network theory:

> Science is a vast enterprise of writing, but to move from an inscription to a statement, and from one statement to another, requires embodied skills and/or technical devices ... it is the constant interaction between inscriptions, technical devices, and embodied skills that leads to the development of statements. (Callon, 1995 p.51)

Nevertheless, scientific activity does not simply produce statements; often it seeks to move statements out of the laboratory. Here Latour's approach can be seen as a challenge to the conventional distinction drawn by much philosophy of science between the content of knowledge and the context of its production - a key point also raised by Rouse in his argument regarding the problems of epistemic sovereignty. Callon suggests that Latour's notion of inscription, contrary to conventional rationalist approaches to science, allows us to understand how the content and context of knowledge 'are simultaneously reconfigured'. Translation thus leads to the 'identification and shaping of allies and seeking their support.' This involves establishing some form of coincidence of interest between the statements (and devices) produced in the laboratory (or in field studies in ecology) and other, external non-scientific actors, to establish *translation networks* concerned with the development and extension of the translations of a particular set of statements or research results. [248]

Callon identifies two basic forms of these translation networks. First there are those which principally circulate their products within the specialised communities and spaces of science - as statements within the scientific literature and instruments within the laboratory. Second, there are those which 'stabilise some of these entities' (ie statements and instruments) 'and mobilise them to multiply connections with non-specialists' outside the laboratory. In each of these cases however, it is the scientific activity that establishes the translation network.

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[247] The similarity between Rouse's approach and that of Latour and Callon on these points is clear. See also Latour (1987), especially Chapter 6.

[248] Callon says that the notion of a translation network 'refers to a compound reality in which inscriptions (and in particular, statements), technical devices, and human actors (including researchers, technicians, industrialists, firms, charitable organisations, and politicians) are brought together and interact with each other.' (Callon, 1995 p.52)

Callon argues that when networks of the second type are established they extend and grow because scientists, by virtue of the defining role they play in the manufacture of statements and instruments, are able to speak 'on behalf of' the scientific entities produced (eg DNA, electrons, and I would argue, entities such endangered species, environmental hazards etc). [249]

However, what is important about this second type of translation is that in extending the network beyond the scientific journals and laboratories, scientists translate scientific entities for non-scientific interests (companies, governments, interests groups). In doing so they thus are also potentially in a position to speak on behalf of substantial numbers of other actors external to science who have developed an interest in a particular scientific entity or who may see these as of benefit to their own interests in some way.[250] Scientists play a unique role here in that they are engaged in a *double translation or representation*. This occurs, first in translating the statements that manufacture the content of scientific knowledge (producing the entities to which their statements refer), and second, in shaping the context in which such knowledge (and entities) are relevant to, and interact with, other interests and networks. This is of particular significance because representation in science cannot be separated into statements and the objects to which these refer or correspond in some external 'real' world. The entire process is rather a chain of translations in which any single statement can be understood as a series of translations, which refer to a multitude of other inscriptions, embodied skills and technical devices.

Callon further suggests two important consequences of such an approach. First, because statements do not refer to an 'outside reality' but are simply 'location points' in a teeming network of such statements etc, it is not possible to speak of a single 'reference' but only of 'an entanglement of micro references'. What we take as a reference to the 'out-thereness' of entities in the world is only a focus on the 'final' statement in a chain of translations.[251] Hence, reference is much like power for Foucault, 'nothing more than an effect of a translation chain' the robustness of which 'depends entirely upon the latter.' (Callon, 1995 p.53) The second consequence of the translation network approach is that it explains that particular strength of science which allows the scientist to 're-present' in their translation of statements and techniques the interests of other actors attracted to that particular area of scientific work. They are able, that is, to 're-present'

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[249] Callon describes a third type of translation network - which is in effect a more dynamic version of the second type - in which networks are 'active on both fronts and enter into a dynamic expansion, where each translation within the laboratory leads the network outside to be lengthened.' (Callon, 1995 p.52)

[250] See Callon (1986) and Latour (1983) for detailed case studies of how this occurs.

[251] There is a parallel here with Hacking's notion of 'phenomena' as used by Rouse. See Chapter 6 of this thesis.

themselves as the 'spokesperson of both nature and society.' (Callon, 1995 p.53) [252]

A key claim of actor network theory, therefore, is that the 'facts' of the natural sciences are, like those of the social sciences, constructed. They are established through the production of strong associational networks - the stronger and more extensive a network becomes, the more solid the scientific facts become.

> The scientist, by successfully recruiting allies, both human and non-human, appealing to authority, referring to former texts and procedures, compiling data, creating computer files, utilising laboratories and equipment, etc, is able to create an encompassing network, the sponsorship of a sustaining audience, and ultimately a community of truth. It is through this network-building that the scientist is able to go from soft rhetoric to hard knowledge ... What becomes a scientific fact and an accepted truth is a direct outcome of the strength of the ties, or in [Latour's] words 'metrological chains', [253] which a scientist or group of scientists is able to construct and enforce. If the scientist has been successful, reality has been defined. (Ward, 1994 p.83)

This approach goes directly to the problem of the relationship between the highly formalised natural sciences and relations of power in society, which as we saw in an earlier chapter, is precisely the issue Foucault dismissed as an 'excessively complicated' question in which the 'threshold of explanation is impossibly high'. (Foucault, 1980d p.109-110) However the general approach of actor network theory to knowledge and power is similar to that adopted by Foucault. It is also able demonstrate that the difference between the 'inside' and 'outside' of the laboratory is in effect the same sort of relationship Foucault pointed to in his analyses of the social sciences which pointed to the continuity between the 'micro' and 'macro' levels of social structure.

At the same time actor network theory allows us to explain the special character attributed to natural science - which Foucault regarded as connected to 'the centralising powers' and functions of institutionalised scientific discourse in Western societies. [254] The actor network approach argues that in modern societies

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[252] In fact this is, as I argue below, one way of accounting for the particular effects, repeatedly commented on in Foucault's works, of the 'power which the West since Medieval times has attributed to science and has reserved for those engaged in scientific discourse.' (Foucault, 1980e p.85)

[253] A metrological chain is another term used by Latour for a translation chain. See Latour (1987) p.179.

[254] Foucault refers to the 'effects of the centralising powers which are linked to the institution and functioning of an organised scientific discourse with a society such as ours' and which are

the most dynamic and important sources of power come from science, and 'not from the classical political process'. [255] Indeed Latour suggests that the very techno-scientific processes that political science and sociology have 'deemed uninteresting or too technical to be analysed' [256] are in fact more influential than many social processes. (Latour, 1983 p.168)

As indicated in my discussion of Rouse in Chapter 7, what makes science so important (and indeed, 'special') is its ability to shape the world *outside* of the laboratory by *translating* the disciplinary conditions of the laboratory into broader social, economic and technological arenas. Latour explains that this performative characteristic of science resides in its ability to enrol and enlist the interests of 'outside' actors in its translation networks. He uses the example of Pasteur's research into anthrax to illustrate this argument. What was crucial in making the science of microbiology a powerful force in both agriculture and medicine (with profound social and economic consequences), was the work of Pasteur's team in convincing agricultural interests that the anthrax disease could be controlled through the scientific knowledge developed in his laboratory. This was only possible however if farm practices were reorganised in ways which translated into the field those laboratory conditions and practices which allowed the anthrax bacillus to be manipulated and rendered docile.

What made this possible was the scientific success in manipulating translations of *scale*. The artificial, highly disciplined micro environments of the laboratory allowed manipulations of the bacillus in ways that were just not possible on the pre-scientific farm. The laboratory application of the techniques of sterility, isolation, vaccine testing, etc provided a regime of simplification and discipline needed to study how the anthrax disease worked. That is, it enabled a disciplining of the entire anthrax disease, which the unruly 'outside' world of the farm would not. There are two elements to Latour's argument here. First, the laboratory techniques which permit the systematic analysis of the disease behaviour must be perfected in the highly artificial, constructed environments of the laboratory. However, and this is Latour's crucial second point, for the knowledge and techniques accumulated on the micro scale to be successfully translated into the macro world of the farm and commercial agriculture, a very important precondition must be present. That is, in order to extend the success rate

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endowed with a special ability to invest particular discourses 'and those who uphold them with the effects of a power which the West since Medieval times has attributed to science and has reserved for those engaged in scientific discourse.' (Foucault, 1980e p.84-5).

[255] The similarity of this to Beck's analysis of science and technology in risk society should be noted although there are important differences. See Chapter 3; I consider this further in the Conclusion of this thesis. See also Rutherford (1999a).

[256] These, of course, are the two reasons I suggested in the previous chapter for Foucault's relative lack attention to the natural sciences.

of the vaccine in the laboratory to the farm, it is also necessary to *extend the disciplinary regime of the laboratory onto the farm*. Pasteur's vaccine will only work on the condition that the farmer 'respect a limited set of laboratory practices - disinfection, cleanliness, inoculation, timing and recording' etc. The key to this extension of scientific discipline from laboratory to the 'outside world', Latour points out, is the ability of the scientists to extend their 'translation network to enlists the actors outside the laboratory - the farmers, government officials, etc. For this to happen, the non-scientists first had to accept the scientists' expertise, that is, to follow the prescribed techniques and accept their scientific statements as having the authority of 'truth'. (Latour, 1983 p.150-52)

One of the key criticisms levelled by Latour at the sociology of science is that it fails to recognise laboratories as one of the few 'fresh sources of politics' in contemporary society. Much sociology of science accepts that the inside/outside dichotomy does not hold true. However, rather than understanding the scientific space (the laboratory) as a dynamic source of power, such sociology sees the laboratory as a fundamentally ordinary place. Latour agrees the substantial number of anthropological studies of laboratories over recent decades have dissipated many of the arguments about the special *epistemological* status of the natural sciences - that, indeed there is nothing special or unique in the cognitive and social practices of science. The problem raised by Latour however is that this fails to account for the importance of science and technology in contemporary society. His response is to concede that scientific fact is the 'product of average, ordinary people and settings, linked to one another by no special norms or communication forms.' What makes the natural sciences powerful is in fact something very simple - the use of inscription devices. (Latour, 1983 p.157- 62)

Hence, the influence of science in society can be explained by bringing together the three threads of Latour's approach to actor network theory. First, is the dissolution of the inside/outside boundary between 'science' in the laboratory and 'society' outside. Modern science is very much applied science, or what Latour and others have called 'techno-science'. (Latour, 1987) In order to flourish, such science must be concerned with capturing the interests of others, that is, it must be able to translate scientific statements in such a way that these are discursively framed in terms which problematise the development and application of economic and social interests.[257] Second, is the inversion of the scale of micro/macro levels through the expertise obtained by partitioning and disciplining micro-phenomena in the laboratory and through mathematical or computer modelling. This simplification and 'scaling down' produces a change of scale which makes possible a *reversal* of the actor's strengths so that what is overwhelming in 'the field' can be made manageable and open to manipulation in

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[257] Latour (1983) p.145-6.

the scientific space. (Latour, 1983 p.145-7; 1987 p.233-7) When successful, such inversion of scale makes the scientist (and their 'outside' allies) powerful where previously they were weak.[258] Third, is the processes of inscription and the formation of '*centres of calculation'*. Irrespective of the objects or phenomena of scientific study, the only way they can be rendered manipulable is through the process of inscribing vast quantities of information and data into a form that can be measured and compared. That is, information is reduced to a written trace that not only makes the 'perceptive judgment of the others *simpler*', but it also limits the modalities (and hence counter-arguments) that a reader can add to the statements involved. (Latour, 1983 p.161)

When combined with the change of scale referred to above, the laboratory is at the centre of a series of long chains through which information is gathered and inscriptions generated, combined, condensed and then re-dispersed and inserted in the practices of the world beyond the laboratory. In this process the laboratory becomes a centre of calculation that draws on resources scattered across numerous networks. Inscription devices and the traces they produce (especially numbers and statistics) allow the operation of centres that are capable of acting at distance 'on unfamiliar events, places and people.' [259] The use of cartography as a tool of European colonial 'exploration' is used by Latour to illustrate the operation of such centres of calculation in 'bringing back' and disciplining the unfamiliar and distant. [260]

In this way, Latour argues that it is largely meaningless to attempt to distinguish between the social context of science and the content of science as produced in the laboratory. There is no clear cut separation between the laboratory and the 'outside' world - rather the laboratory, that which in most respects is a rather 'ordinary place', is powerful precisely because it is a *technological device* capable of inverting 'the hierarchy of forces' in society (Latour, 1983 p.159, 164):

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[258] 'The change of scale makes possible a reversal of the actors' strengths; 'outside' animals, farmers, and veterinarians were *weaker* than the invisible anthrax bacillus; inside Pasteur's lab, man becomes stronger than the bacillus, and as a corollary, the scientists in his lab gets the edge over the local, devoted, experienced veterinarian.' (Latour, 1983 p.147)

[259] This is achieved by 'inventing means that (a) render them *mobile* so that they can be brought back (ie to the centre); (b) keep them *stable* so that they can be moved back and forth without additional distortion, corruption, or decay; and (c) are *combinable* so that whatever stuff they are made of, they can be cumulated, aggregated, or shuffled like a pack of cards.' (Latour, 1987 p.233)

[260] A somewhat parallel notion can be found in Foucault when he deals with spatial issues: 'Once knowledge can be analysed in terms of region, domain, implantation, displacement, transposition, one is able to capture the process by which knowledge functions as a form of power and disseminates the effects of power.' (Foucault, 1980c p.69)

> The specificity of science is not to be found in cognitive, social or psychological qualities, but in the special construction of laboratories in a manner which reverses the scale of phenomena so as to make things readable, and then accelerates the frequency of trials, allowing many mistakes to be made and registered. (Latour, 1983 p.165)

What makes such an otherwise ordinary technological device socially powerful is that in order to achieve a similar degree of predictive reliability (and success) in the application of scientific knowledge outside the microworld of the laboratory, it is essential to first extend to the outside the highly contrived conditions responsible for production and verification of statements which exist in the laboratory. In other words, in order to allow the scientific 'facts' to circulate beyond the laboratory it is necessary to greatly extend those 'costly networks inside which they can maintain their fragile efficacy', and this 'means transforming society into a vast laboratory'. (Latour, 1983 p.166)

Here Latour's argument is similar to that employed by Beck (in the latter's analysis of 'risk society') when he points out that in modern technological societies it is science, and not 'the classical political process' which is the source of power. It is the unseen, autonomous, but nonetheless *ordinary*, everyday practice of science that shapes so much of politics and social change. These laboratory forces, argues Latour, 'can displace society and recompose it by the very content of what is done inside them, which seemed at first irrelevant or too technical.' Indeed, in a rebuff to the argument put by Foucault, Latour insists that the careful scrutiny of the natural sciences cannot be ignored for the political 'gets all its really efficient sources of power from the very laboratories that have just been deemed uninteresting or too technical to be analysed.' (Latour, 1983 p.168)

Elsewhere Latour directly addresses the very point raised by Foucault when he sought to separate the 'dubious' human sciences from the 'highly formalised' natural sciences. It is worth quoting Latour's comments on this at length, as they clearly draw the connection between the highly formalised character of the so-called 'hard' sciences and his notion that the strength of these sciences is built up through centres of calculation operating as a generalised apparatus of power:

> When people wonder how 'abstract' geometry or mathematics may have some bearing on 'reality', they are really admiring the *strategic position* taken by those who work inside the centres on forms of forms. They should be the weakest since they are the most remote (as it is often said) from any 'application'. On the contrary, they may become the strongest by the same token as the centres end up controlling time and space: they design networks that are tied together in a few obligatory passage points. Once every trace has been not only written on paper, but rewritten in geometrical form, and re-written in equation form, then it is no wonder that those who control geometry and mathematics will be able to

> intervene almost anywhere. The more 'abstract' their theory is, the better it will be able to occupy centres inside the centres. ... The more heterogeneous and dominating the centres, the more formalism they will require simply to stay together and maintain their imperium. Formalism and mathematics are attracted by the centres, if I dare make this metaphor, like rats and insects to granaries.' (Latour, 1987 p.245)

Thus the very formalism and abstractness that Foucault took as signalling the detachment of the natural sciences from power relations is shown by Latour to be precisely mechanism by which science and technology are able to profoundly shape such power relations.

Latour and Foucault: affinities and differences

The literature on actor network theory is scattered throughout with largely positive references to Foucault. This suggests an intellectual affinity between the two that nonetheless remains largely in the background.[261] The reason that this is 'in the background' is undoubtedly related to the fact that actor network theory is concerned with the power of the natural sciences ('technoscience') and Foucault was not. However, in an interview published in 1993 Latour commented on Foucault's work in more detail. (Crawford, 1993) Here Latour admits that he has used and read Foucault quite 'a lot', in particular Discipline and Punish, which he regards as 'a fascinating field study on the dissemination of power.' He singles out Foucault's notion of the 'regime of statements and how they spread', suggesting that this approach lends itself very effectively for use as a network argument. The importance of Discipline and Punish, according to Latour, was that it demonstrated not simply that knowledge is necessary to the exercise of power, but more importantly, showed for the first time that a specific apparatus of power, a *dispositif*, is necessary to establish and maintain both society and knowledge. (Crawford, 1993 p.251) Latour expresses particular interest in Foucault's work on the panopticon, which he sees as an example of the same general form of 'intellectual technological dispositif' that he has pointed to in the scientific laboratory. In fact says Latour,

> In that sense, the dissemination of laboratories, their ability to reverse scale, to completely reverse micro and macro order, is very much a *confirmation of Foucault's tradition*. But of course, there are many more dispositifs than the panopticon. (Crawford, 1993 p.253 - emphasis added)

Likewise, Latour's comment on centres of calculation quoted above suggests a parallel with Foucault's notions of panopticism and the *dispositif*, although such

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[261] See for example the following references to Foucault: Callon (1995) p.51, 62 and (1986) p.224; Latour (1986) p.279 and (1991) p.13; Law (1991a) p.169-170, 173, 187, (1997) p.3 and (1994).

an analogy also throws differences into relief. [262] Kusch points to Foucault's differentiation between micro-relations of power at the level of the individual (or small groups), and macro-level mechanisms of power as embodied in systems of institutional coercive. (Kusch, 1991 p.143) While Foucault undoubtedly saw these two levels of power relations as interconnected, they are nevertheless different and distinguishable. In particular Foucault drew attention to the often unforeseen and unintended effects of the emergence of macro-relations of power, in the course of which 'micro-mechanisms' of power were 'invested, colonised, utilised, involuted, transformed, displaced, extended, etc by ever more general mechanisms and by forces of global domination.' (Foucault, 1980e p.99) [263] These more general apparatuses of power, the dispositifs, were of course embedded in the institutions of the prison, the clinic, the asylum etc which Foucault saw as intimately intertwined with the rise of the theories and practices of the human sciences. While Foucault examined the emergence of modern biology, especially in his earlier archaeological works, his studies of dispositifs and the systems these formed focused on institutions of social coercion - or more accurately, on disciplinary institutions and systems of subjectification. His concern was *not*, as I have said previously, with the institutions of natural science.

Kusch argues that although Foucault never gave a detailed account in his writings, he nevertheless appeared to suggest a 'two-fold explanation' of the existence of dispositifs, which relied upon both a description of 'the *structure*, *profile* or *composition*' of institutions and an explanation of the '*conditions of its possibility*'. (Kusch, 1991 p.145) According to Kusch, understanding the composition involves studying how micro-relations of power are 'colonised' by institutions and systems. This is a dual task involving the study of the dispositif 'both as social laboratories, and as the results of this laboratory work.'[264], Understanding the second element, its conditions of possibility, requires in itself a double task. The first is the identification of what Foucault (1980e p.101) called 'the immediate social *entourage*'. Kusch describes this as those groups of social actors who see the dispositif as in some way having the potential to influence the scope or efficiency of a given network of power in their favour. (Kusch, 1991 p.147) The second task involves studying processes of subjectification, that is,

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[262] Latour explicitly makes this connection between panopticism and centres of calculation - see my discussion later in this chapter and Crawford (1993).

[263] See also Foucault (1980a) p.199-200.

[264] Hence, Kusch interprets the *dispositif* as 'spaces where experimentation with small, closed power networks, or social 'microworlds' is possible, spaces where new technologies of more efficient, more extensive, more diverse forms of control, manipulation, authority, coercion, punishment and deterrence are developed.' (Kusch, 1991 p.146) Kusch's somewhat negative interpretation would be better qualified by recognising the role of normalising and self-formative processes of subjectification that could also be a product of such a system - not to mention the inherent propensity for such institutions to spawn resistance to their schemes.

how some actors are constituted as 'inmates and victims', while others are constituted as functionaries and officials, or what Foucault called 'hierarchisation'.

Foucault cast his notion of power in terms of networks and chains. (Kusch, 1991 p.138) Where he specifically addressed the nature of power, he always insisted on it being treated as a relationship rather than an attribute. Hence, all power relations 'are rooted in the system of social *networks*' and power is 'coextensive with every social relationship.' (Foucault, 1982 p.224 – emphasis added) Similarly he argued that power 'must be analysed as something which circulates, or rather as something which only functions in the form of a chain ... Power is employed and exercised through a *net-like organisation*.' (Foucault, 1980e p.98 – emphasis added) [265] Indeed in many of the works of his genealogical period [266] Foucault suggests that the individual actor or subject exists within networks of power and that these are constitutive of the identity of the subject. [267]

This reading suggests that the parallels between the approaches of Foucault and Latour are substantial. For example, Latour's emphasis on the importance of problematisation and capturing others' interests (what Callon calls *interessement* [268]) is reminiscent of Foucault's admonishment that understanding how mechanisms of power function requires historical investigation 'beginning at the lowest level' to identify the actors responsible for such mechanisms and the ways in which these became 'economically and politically useful' at a 'precise conjuncture' in representing particular interests. (Foucault, 1980e p.101) Foucault's studies of the human sciences repeatedly pointed to this process of problematisation (for example insanity, crime, sexuality) and the ways in which

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[265] Dean (1998b) acknowledges the substantial elements common to both Foucault's notion of 'regimes of practices' or *dispositifs* and the actor network theory notions of socio-technical networks and 'technological systems'. He also argues that while Foucault shared with Callon and Latour a 'constructivist' understanding of knowledge as being formed within 'particular regimes of truth and rationality, then within regimes of practices, and finally in relation to what might be called "regimes of identity", his methodology and, more importantly, his purposes, depart dramatically' from what Dean sees as the underlying 'realism' of actor network theory. I disagree that actor network theory can be said to embrace realism, at least of a kind that could be associated with a correspondence theory of truth. See my discussion of translation networks earlier in this chapter.

[266] Darier suggests Foucault's work can be roughly grouped into an archaeological, genealogical and 'final' periods. See Darier (1999c). McNay (1994) suggests a similar approach.

[267] Following Hindess, in the previous Chapter I suggested that in his later works, Foucault moved away from the view that the actor was largely, if not fully, defined by these relations and adopted a view which that was perhaps closer to the view of subjectivity traditionally advanced by critical theory.

[268] Callon defines *interessement* as 'the group of actions by which an entity ... attempts to impose and stabilise the identity of the other actors it defines through its problematisation.' See Callon (1986) p.207.

expertise is instrumental in the formation of specific modes of subjectivity - a process which thereby defines both the identity and interests of social actors. [269] Similarly, it is possible to discern a clear equivalence between Latour's rejection of the inside (laboratory) / outside (society) distinction and Foucault's emphasis on the 'two-way borrowing' of mechanisms of power (and knowledge) between disciplinary institutions and the wider social environment. Kusch is surely correct therefore in concluding that:

> In Foucault, the Latourian laboratory is replaced by coercive institutions, but otherwise the line of thinking is similar: coercive institutions are the social laboratories for new forms of control and discipline ... and the results of these social experiments are extended to ever new social domains. (Kusch, 1991 p.190-91)

Actants and agency

The preceding discussion has avoided consideration of the most significant difference between Latour and Foucault - that for actor network theory the distinction between society and nature is blurred to the point where agency cannot be regarded as a property exclusive to the human subject, as it remained for Foucault. In this section I therefore turn to a closer examination of the way in which actor network theory deals with the question of agency. This is a particularly important issue as, on the surface at least, it is this which radically undermines the traditional approach to political philosophy, centrally concerned as it is with the problem of the sovereignty of the human subject. A position, as I have argued in the preceding chapter, which was not fully relinquished by Foucault's attempt at 'beheading' the sovereign in political philosophy.

The consequence of the actor network theory claim that a clear ontological distinction between nature and society cannot be sustained is something that will be considered further in the Conclusion. Here I examine some specific criticisms levelled at Foucault by Latour, before turning to consider the way in which Latour problematises agency. This is useful both because it highlights my contention that Latour's approach is in fact not inconsistent with the general intellectual orientation of Foucault's work on genealogy and governmentality, and because it provides some valuable insights into how a *biopolitics* of the environment [270] might be understood and studied further.

In the interview cited earlier in this chapter in which Latour commented on the influence of Foucault's work on his own, he also outlines some substantial

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[269] There is also evident a strong emphasis on this in post-Foucault governmentality studies - see in particular the importance placed on this by Rose and Miller (1992).

[270] Earlier I referred to this in terms of 'ecological governmentality'. See also Rutherford (1999b)

criticisms of Foucault. In doing so he places Foucault within the epistemological tradition of Canguilhem and Bachelard, 'a tradition that shows how science should escape by a succession of breaks from its past and its social condition.' (Crawford, 1993 p.251) [271] This characterisation is consistent with the argument Foucault used to explain the distinction between social science and the science of nature and how the latter was able to separate itself from the disciplinary technique of the human sciences, especially the examination. [272]

Latour sees Foucault as part of a 'peculiarly French' tradition in the history of science, which permits the natural sciences ('the hard sciences') to escape serious criticism.[273] Indeed, from a critical perspective, the natural sciences are 'unstudiable from first principles' in France because of this, and this is reflected in the position taken by intellectuals such as Lyotard, Baudrillard etc, whom Latour regards as 'completely scientistic as far as science is concerned'. Hence Latour cautions that it is necessary to bear in mind the extent to which the natural sciences escape serious criticisms in 'the French tradition', a tradition of which 'Foucault is very much part'. (Crawford, 1993 p.251-2) It is against this background that Latour criticises Foucault's work for being unbalanced ('asymmetrical'), in that it largely ignored these very sciences. By doing so Foucault 'shunned the hard cases' and as a result says Latour, it is difficult to fully evaluate the usefulness of his approach for analysing the natural sciences. While Foucault redefined the relationship between knowledge and power in the social sciences, he did not do the necessary work in relation to the 'hard sciences'. Latour questions whether Foucault's vocabulary and concepts could usefully be transferred to such an analysis, arguing that the real test of the Foucauldian redefinition of power would be to see whether or not it could be extended to those sciences concerned with non-human entities. He concludes, while acknowledging the influence of Foucault's work on his own, [274] with the 'suspicion' that

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[271] For a detailed study of Foucault's relationship to French history of science, and especially Canguilhem and Bachelard, see Gutting (1989).

[272] This is discussed in an earlier chapter. Interestingly, Foucault did concede that the 'forms of inquiry and examination' could interact 'and as a consequence the sciences of nature and man also overlapped in terms of their concepts, methods and results. I think that one could find in geography a good example of a discipline which systematically uses measure, inquiry and examination.' (Foucault, 1980c p.74-5). This suggestion that geography involves an 'intersection' of the human and natural science is particularly interesting given the important contribution of geography in the nineteenth century to the development of a specifically environmental discourse. It is perhaps not accidental that contemporary universities still frequently locate environmental studies within their geography programs.

[273] This is hardly a peculiarly French phenomenon, although it is perhaps stronger in French intellectual culture than some others.

[274] Latour says 'I have used Foucault and read him a lot, so he might be absorbed in my thinking probably much more than I recognise.' Crawford (1993) p.252.

'Foucault retained the typically French attitude - a complete belief in the solidity of the hard sciences.' (Crawford, 1993 p.252)

Latour's criticism of Foucault's 'asymmetry' towards the natural sciences should not be understood simply as the complaint that he paid too little attention to the natural sciences. Rather it reflects a *methodological* concern central to actor network theory and its particular reinterpretation of agency. Both Callon (1986) and Latour (1994) propose the adoption of what they describe as a 'generalised principle of symmetry'. This is an extension of the principle of symmetry put forward by David Bloor for the 'strong program' in the sociology of science. Bloor argues that both truth and falsity, and rational and irrational behaviour, should be analysed in the same terms rather than segregating these into two incompatible spheres. In his studies of the human sciences Foucault clearly adopted a position that consistent with this methodological principle. However Latour and Callon extend this principle further to encompass the study of human and non-human behaviour - that is, in studying both 'nature' and 'society' they insist we should not switch analytical frameworks when moving from the social to the technical aspects of a problem. Latour sees this as not only consistent with, but as a logical development of, Bloor's approach. The difference is that instead of explaining society and nature in social terms as does Bloor, Latour argues that both sorts of phenomena should be analysed in terms that are neither social nor technical but rather *socio-technical* or *collective*. (Crawford, 1993 p.255-6; Latour, 1993 p.4-5) By collective Latour means the tangling together or 'hybridisation' of society and the 'objective world (things-in-themselves)'. (Latour, 1994 p.793) Such an approach, Latour readily admits, blurs the boundaries between subject and object, and as a result is frequently accused of either anthropomorphism (Schaffer, 1991) or the mechanisation of subjectivity. (Collins and Yearley, 1992)

For actor network theory, an agent or *actant* is a semiotic definition. An actant is something that acts, without any necessary implication of its being human; it can, says Latour 'literally be anything' provided it is the source of an action. (Latour, 1997) [275] Hence, within actor network theory the notion of agency does not provide, nor is it intended to provide, a model of human subjectivity or

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[275] Elsewhere Latour and Callon comment on their notion of an actor in the following terms: 'To replace the usual divisions (micro/macro, human/animal, social/technical), which we have shown to be unprofitable, we need terms in keeping with (our new) methodological principles. What is an 'actor'? Any element which bends space around itself, makes other elements dependent upon itself and translates their will into a language of its own. An actor makes changes in the set of elements and concepts habitually used to describe the social and natural worlds ... [A]n actor can make ... asymmetries last, can lay down a temporality and a space that is imposed on others ...Weak, reversible interactions are replaced by strong interactions. ... Instead of swarms of possibilities, we find lines of force, obligatory passage points, directions and deductions.' (Callon and Latour, 1981 p.286)

even a catalogue of basic human competences. Indeed, the most fundamental argument of actor network theory is that every entity, whether the self, society or nature is the product of semiotic work - each involves the building of the actant through 'attributing, imputing (and) distributing action, competences, performances and relations'. The claim that actors are 'infinitely pliable' and heterogeneous is not meant to describe any 'real *observed* actor', but is the semiotically 'necessary condition for the *observation* and recording of actors to be possible.' (Latour, 1997 p.6) This semiotic work is performed through the heterogeneous processes of translation and problematisation within networks, and importantly this leads to what Latour describes as an ontological claim about the network-like character of the actants themselves. Actor network theory therefore shares with Foucault the view that the actor is defined by relations of power and the accompanying capacity for action within those relationships. However, actor network theory carries the assumptions about the types of historical and discursive (semiotic) work needed to build an entity beyond those bearing on human subjectivity, and extends this methodological approach to all actants.[276]

One key consequence of this application of Latour and Callon's generalised principle of symmetry is that the opposition between society and nature, and the distinction of passive 'things' from active human 'subjects' is of very limited heuristic value. Rather than separate branches of an unbridgeable dichotomy, these previously 'fundamental' categories are best seen as the reified extremes of a continuum established by translation networks. As Callon suggests, if there is still a need to speak of nature and society, it is preferable to see this in terms of a 'socio-nature' woven by translation networks, as an 'in-between that is inhabited by actants whose competences and identities vary along within the translations transforming them.' To be sure, both 'passive beings and genuine actors' populate socio-nature, but an ontologically unambiguous 'dividing line' cannot be laid down. (Callon, 1995 p.58)

Against the background of the preceding discussion, the actor network theory approach to agency can be summarised. Following John Law (1991a p.173, 187), an agent can be defined as *a structured set of relations stable enough to generate a durable series of power effects*. This definition encompasses Foucault's characterisation of power as action on the actions of others (ie active human subjects), however, it also covers the broader range of network building and translation activities discussed by Latour and Callon. It therefore should be taken as including what Foucault referred to as relationships of communication and objective or technical capacities. This is consistent with Foucault's approach

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[276] This sort of approach is implicit to the argument I have put forward regarding the extension of Foucault's concept of biopolitics to environmental issues. See Chapters 6 and 7 of this thesis. See also Rutherford (1999b) and Tully (1997).

when he suggested that blocks of 'capacity-communication-power' could come to 'constitute regulated and concerted systems'. (Foucault, 1982 p.218)

Further, *agents are at the same time both sets of relations and 'nodes in sets of relations'*. This recalls something very much like Deleuze's notion of assemblage ('*agencement'*) which combines the idea of arrangement or organisation with the suggestion of agency. Hence, an assemblage is neither a unity nor a totality, but a multiplicity, in which what is crucial is not the constituent elements but the relations between the elements. (Cooper, 1997 p.3-4) In Latour's words, 'a network is not a thing but the recorded movement of a thing'. The network cannot exist independently of the act of constituting it ('tracing') - the 'nodes' are actors whose definition of the world simultaneously delineates the network, while they themselves are shaped by the networks of relations within which they exist. (Latour, 1997 p.9)

In addition, *entities other than people may be agents*. This runs counter to the general direction of Foucault's work, for while arguably he accepted that social groups and even institutions could exhibit agency, he would not extend this to non-social entities. Non-human entities may be drawn upon as technical capacities to support power relations in the formation of disciplinary blocks, but power relations proper for him were inseparable from the 'person who acts'. Hence for Foucault agency is strictly anthropocentric - agency ('the exercise of power') is 'always a way of acting upon an acting subject or acting subjects by virtue of their acting or being capable of action.' (Foucault, 1982 p.220)

Finally, the relations which constitute agents are *rarely, if ever, purely social relations*. Rather, as Law puts it:

> they are heterogeneous, partly social, partly technical, partly textual, and partly to do with naturally occurring events, objects and processes - and most usually combine elements of all of these; this, of course, means that actors are similarly heterogeneous; and it means that there is almost never any such thing as a purely social actor. (Law, 1991a p.173)

Such an approach differs from that of Foucault. As noted above, he distinguishes power relations from those of communication and technical capacities. Yet he also notes that these three types of relationship 'in fact *always overlap*' and support each other in a reciprocal manner. (Foucault, 1982 p.218 - emphasis added) [277] Again, while this is perhaps a question of emphasis, the overall conclusion is inescapable that for Foucault power relations and agents are exclusively social. The consequences of actor network theory's redefinition of agency are potentially significant, although not fundamentally at odds with the general concerns that

[277] See also Foucault (1984b) p.48.

underlay Foucault's work on genealogy and governmentality, as suggested at the start of the current chapter. The issue here is whether or not there is a strong basis for maintaining different models of representation for human and non-human entities?

Representation and the modern constitution

In Chapter 7 I discussed what Hindess (1996) referred to as Foucault's incomplete critique of sovereignty. I also noted his comment that aside from sovereignty, the other constitutive fiction of modern political thought is that of political community. In the concluding section of is chapter I wish to explore how actor network theory may contribute to a consideration of these issues within the general philosophical perspective developed by Foucault.

Consistent with his argument regarding the collective or hybrid nature of 'socio-nature', Latour provides a critique of the modern notions of representation. He defines 'modern' to be 'when the political constitution of truth creates … two separate parliaments' – or modes of representation – 'one hidden for things, the other in the open for citizens.' (Latour, 1991 p.15; 1993 p.10-11) His discussion of this draws on the work of Shapin and Schaffer (1985) which examines the debate between the founder of the Royal Society, physicist Robert Boyle, and political theorist Thomas Hobbes, on the relationship between politics and science. Shapin and Schaffer detail the ways in which during the eighteenth century these key progenitors of modern science and politics struggled to establish the now familiar demarcation between the politics and science. Shapin and Schaffer's historical research showed how the 'experimental community' established by Boyle energetically elaborated and deployed a set of 'boundary-conventions', which defined the inside/outside of science and were able to 'transport politics outside of science'. (Shapin and Schaffer, 1985 p.342) In this regard, their work can be regarded as falling within the mainstream of the Edinburgh School of science studies with its focus on explaining science in its *social context*.

Latour's interpretation and use of this work goes beyond that intended by the authors and they certainly do not share Latour's conclusions. Nevertheless, Latour argues that if the logic of Shapin and Schaffer's detailed historical work is pursued, [278] the debate in question can be seen to be about far more than Hobbes

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[278] That is, if Shapin and Schaffer did not apply an 'asymmetrical' approach to their study by privileging the 'social' context. They take great care says Latour, to understand scientific facts as a historical and political invention, but 'they take no such precautions where political language itself is concerned. They use the words 'power', 'interest', and 'politics' in all innocence. … criticising science but swallowing politics as the only valid source of explanation' … (as does Hobbes) … with his construction of a monist macro-structure in which knowledge has a place only in support of the social order.' (Latour, 1993 p.15-27)

and Boyle defining separate discourses about the proper conduct of science and politics. In fact, between them Hobbes and Boyle played a central role in the 'invention' of the modern world - a world 'in which *the representation of things through the intermediary of the laboratory is forever dissociated from the representation of citizens through the intermediary of the social contract*.' (Latour, 1993 p.27) Both of these modes of representation - the state (Commonwealth) and the laboratory experiment - can clearly be demonstrated to be inventions, 'artificial constructs'. Indeed argues Latour, Boyle and Hobbes were the eighteenth century drafters of *the* 'modern constitution'; they invented and articulated the modern dichotomy between the political representation of sovereign subjects and the scientific representation of non-human objects. (Latour, 1991 p.13)

This dichotomy only appears tenable if the two sides are thought of as strictly separate. Political representation for Hobbes was the product of sovereign, rational citizens with interests whose common consent constitutes the Leviathan. This is an inherently paradoxical entity, for it is at one and the same time a creature composed of the wills of the individual citizens and the sovereign who personifies the common will. Yet despite this, the political state is nothing other than relations between sovereign human subjects, that is, *social* relations and these alone. Parallel to this political representation, Boyle defines the representation of nature through the equally artificial apparatus of the laboratory and scientific method. In the laboratory, through the application of machines and instruments, facts are extracted from nature, but to ensure the recognition of facts (as distinct from mere impressions), Boyle's science set strict limits on who was to be authorised to interpret the meaning of data obtained through experiment. Boyle establishes, through the Royal Society, the community of scientists, disinterested witnesses who meticulously represent the facts, that is, he invents the modern notion of the expert. But asks Latour, who is speaking when the scientist speaks? In itself nature is mute. Notwithstanding, Boyle and those who follow him claim that *the facts* speak for themselves, because through the *discipline* of the scientific method, nature can be seen to behave meaningfully (although not intentionally). Thus nature, which would otherwise remain mute, is 'capable of speaking, writing, signifying' within the artificial realm of the laboratory and through the scientific community who translate the behaviour of objects. (Latour, 1993 p.29)

Latour describes these boundary-defining activities in terms borrowed directly from Foucault. What Hobbes and Boyle (and their intellectual successors) were engaged in was the drafting of '*a political constitution of truth*', or what Foucault called the political economy of truth. (Latour, 1993 p.29) Through the work of Shapin and Schaffer it can be seen that the debate between Hobbes and Boyle was not simply two competing views of representation, in which Hobbes

was the social theorist and Boyle the theorist of nature.[279] Rather argues Latour, as Shapin and Schaffer's historical study demonstrates, both Hobbes and Boyle were rationalists and mechanists resolutely opposed to the 'pre-scientific past'. Both advanced theories of science *and* politics in their struggle with the other, yet as Latour comments

> Hobbes is a scientist whose science has been completely eliminated from later accounts. He is taken seriously only as a political philosopher, while Boyle had a political philosophy, which has been completely eliminated from later accounts. He is taken seriously only as a physicist. (Latour, 1991 p.12)

As with the construction of any 'regime of truth', the detail of why and how particular outcomes occur are very much matters for historical or genealogical investigation. The point is however that the two modes of representation, which together are at the centre of modern thinking, are both historical constructs, not necessary or transcendental truths. They are the product of a particular history (albeit forgotten or subjugated) and like all such historical products subject to the possibility of further change. Indeed, once the historicity of not only political representation, but also the scientific representation of nature is recognised, both must be seen as subject to the central critical question posed by Foucault: in that which appears universal and necessary, what in fact is the product of arbitrary or at least historically contingent constraints? (Foucault, 1984b p.45)

Latour's criticism of political philosophy and its attitude to representation then is similar to Foucault's critique of political sovereignty. However, his focus goes beyond political representation to the attitude of 'well-meaning social theorists' who accept the asymmetrical view that the representation of nature is largely non-political and unproblematic. [280] However Latour's criticisms extend further, for in accepting this dichotomous model of representation, political and social theory ignores not only the 'family resemblance' and interconnection between the natural and social sciences, they also perpetuate the false separation between 'society' and 'nature'. By maintaining such modernist divisions political philosophy denies the collective, hybrid character of entities, and remains incapable of understanding that all human interaction is socio-technical, and indeed that 'the very shape of humans, our very body, is already made in large part of socio-technical negotiations and artefacts.' (Latour, 1994 p.806) Social theory and political philosophy therefore remain bound to a mode of thought that is incapable

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[279] Latour claims that the great contribution of Shapin and Schaffer's work was that it 'unearthed' Hobbes' scientific works so neglected by political science *and* rescued 'from oblivion' Boyle's political theories which had been equally neglected in the history of science. Latour (1993) p.16-17.

[280] That is, 'They accept as a given the result of a political constitution of truth that has first dispatched speech, deafness, and dumbness.' (Latour, 1991 p.14)

(and increasingly more so) of understanding and explaining the mechanisms of societal production and action within the very 'society' for which it purports to provide a social science.

In fact, Latour argues the modernity that is supposedly built on the division of representation, the achievement of which more than any other marks the modern from the pre-modern, does not now and never has really existed. This is not to deny the obvious power and achievements of what we call modern politics, science and technology, but rather to challenge the assumption that a radical separation of society and nature has ever been effected. In reality suggests Latour, the power and achievements of 'modern' society have been possible precisely because it has increasingly afforded more efficient means and opportunities for the production of socio-technical hybrids and collectives. At the same time, Latour's analysis shows why the problems that arise from this blindness to the realities of socio-nature are, paradoxically, both the most intractable for, and at the same time the clearest illustration of the failure of, the modern mode of representation. He points to global environmental problems such as the greenhouse effect, stratospheric ozone depletion, radiation exposure, etc. Here perhaps more than any other area the tangling together of the scientific, the political and the technological-economic illustrates the pervasiveness of socio-technical crossovers involving the exchange of properties between social and non-social entities. (Latour, 1991 p.4, 16-18; 1994 p.795-97)

The term 'modern' as used by Latour thus refers to two quite different sets of practices, which the modern attitude seeks to separate, but which in contemporary society are increasingly blended together. The first of these are the practices of translation discussed earlier in this chapter, which constantly give rise to socio-technical networks and hybrids. The second Latour designates as practices of 'purification', aimed at the creation of the 'distinct ontological zones' of the human and non-human. This second set of practices corresponds to the *modern critical stance*. Latour uses an environmental example to suggest how the practices of translation would 'link in one continuous chain the chemistry of the upper atmosphere, scientific and industrial strategies, the preoccupations of heads of state, the anxieties of ecologists'. The practices of purification, on the other hand, establish the separation between an objective nature, and the historicity of society, replete with 'predictable' human interests. (Latour, 1993 p.12) What characterises modern thought is the separation of these two sets of practices; once we become aware that both sets of practices have historically proceeded side by side, we can start to abandon the modern attitude, or at least question it. It is clear that modernity is framed in terms of humanism – either through the attempt to define the unique characteristics of the human subject or by declaring the death of the subject. As we have seen Foucault, at least to a degree, tends to fall on the latter side of this 'divide'. However, as I have argued, Foucault's work also

retains elements of the belief that at its core, subjectivity must be defined in terms that are bound up with notions of the sovereignty of the human agent.

The work of both Latour and Rouse point to this incomplete critique of sovereignty as being closely connected to a failure to break with a belief in the epistemic 'solidity' of the knowledge produced by the natural sciences. Latour and actor network theory's critique of agency, by undermining the 'double separation' that modernist thought has constructed,[281] calls into question what Barry Hindess describes as the other modern 'constitutive fiction' – political community. Actor network theory's recasting of agency in terms of 'collectives' and socio-technical hybrids challenges this pillar of the modern political thought. For no matter how the critique of the subject proceeds, as long as it continues to locate the historical formation of the subject in *social* processes, it reinforces the modern critical stance. In this perspective agency is always and necessarily a property attributable to human beings. Inasmuch as such human subjects are understood as exercising agency within some form of sociality, the twin concepts of political sovereignty and political community are also necessarily defined in terms of the capacity for human agency and autonomy. The approach of actor network theory, and Latour in particular, thus immediately complicates any analysis of agency and hence relations of power between agents.

Latour's criticism of modernism, of the project of purification, urges us to recognise that we have never been modern because the separateness upon which this is premised cannot be achieved. His approach calls not for an anti-modern or even post-modern attitude, but rather what he describes as a 'non-modern' one. (Latour, 1991 p.17) Such a non-modern attitude recognises that 'there are not two problems of representation, just one.' (Latour, 1993 p.143) It takes seriously the double ambiguity of modernity towards representation, where there is a constant suspicion that political representation (and hence sovereignty) can be corrupted and turned into domination on behalf of particular interests, and similarly that the scientific representation of nature can be corrupted by the interests of those claiming to speak on behalf of the facts. Such fears are themselves premised on the belief in the possibility of purification, of separating two modes of representation.

Latour claims that actor network theory is not a revolutionary call for change, but rather it simply requires that we 'publicly' ratify what we have always done, given that power (ie politics and science) have always involved the shaping and mobilisation of socio-natures. Thus, the pretence of double representation must be

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[281] 'The double separation is what we have to reconstruct: the separation between humans and nonhumans on the one hand, and between what happens 'above' and what happens 'below' on the other.' (Latour, 1993 p.13)

replaced by the explicit admission that there is in fact a single 'parliament of things' within which

> the continuity of the collective is reconfigured. There are no more naked truths, but there are no more naked citizens, either. … Let one of the representatives talk, for instance, about the ozone hole, another represent the Monsanto chemical industry, a third the workers of the same chemical industry, another the voters of New Hampshire, a fifth the meteorology of the polar regions; let still another speak in the name of the State; what does it matter, so long as they are all talking about the same thing, about a quasi-object they have all created, the object-discourse-nature-society whose new properties astound us all and whose network extends from my refrigerator to the Antarctic by way of chemistry, law, the State, the economy, and satellites. The imbroglios and networks that had no place [in modernist representations] now have the whole place to themselves. They are the ones that have to be represented; it is around them that the parliament of Things gathers henceforth. (Latour, 1993 p.144)

Such an approach radically challenges modern notions of the limits of political community, despite Latour's claim that it amounts to little more than openly acknowledging that modernity already constantly (if 'unofficially') produces a proliferation of socio-technical hybrids and quasi-objects.[282] Latour suggests that we can see the beginning of a public acknowledgment of this monist notion of representation in events such as the 1992 UN-sponsored Earth Summit, in which humans and non-humans are brought together 'under the same continuous protection.' (Latour, 1991 p.18)

Conclusion

Despite Latour's tendency at times to sound like a radical environmentalist moralistically affirming the right of nature, actor network theory does offer theoretical insights that complement the work of Foucault and his successors on biopolitics and governmentality. Indeed, as I have suggested, [283] Foucault's analysis of biopolitics provides a potentially useful approach to understanding environmental discourse and problematisations. In particular, Latour's work explains why the problem of nature should not be understood in terms of the modernist opposition between different modes of representation. Of the social theorists discussed in this thesis, the work of Habermas reflects the pursuit of what Latour calls 'the project of purification' at its most sophisticated. However

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[282] There is a clear parallel here with Beck's argument regarding the 'sub-politics' of science and technology in risk society. See Beck (1992b). I discuss Beck in Chapter 4 of the current thesis, and return to this issue in the Conclusion (Chapter 9).

[283] See Rutherford (1999b; 1999a; 1997a)

as I have argued, the modern critical perspective, which is premised on this philosophical separation of the representation of the human subject from the representation of nature, is continued in the work of Foucault and most scholars influenced by his approach.

One need not accept that there is an 'absolute equivalence' between the regulatory practices which operate on human and non-human entities to appreciate the significant capacity of actor network theory to provide both a more genealogical understanding of environmental problems and a critical appropriation of Foucault's work for this task. [284] Indeed, one of the strengths of Latour's work is that it allows us to frame the problem of nature in a way that is open to the sort of detailed study of governmental practices which have been characteristic of works on governmentality in other areas. The approach drawn here from the work of Foucault and Latour enables environmental problems to be studied as 'organised forms of practice' that bring together the four dimensions of government referred to in the introduction to this thesis.

Through its critique of the asymmetrical approach of both political philosophy and science studies to agency and its epistemic representation, actor network theory permits the 'Foucauldian' study of the complex matrix of government. It does this in a way that more fully takes account of what Tully describes as the third dimension of government, that is 'the practical rationalities in accordance with which human aptitudes are exercised on nature through various (material) technologies.' (Tully, 1997 p.6) [285] By being alert to the hybrid character of agency, such an analysis is able to recognise the importance of material technologies and the capacities of non-human entities and processes to the existence of structured relations that are stable enough to generate a durable series of power effects. The role of science and technology in shaping power relations must be seen as central to understanding the ecological dimension of biopolitics, rather than as ancillary and external to the actions of agents as human subjects. The perspective suggested here rejects both sociological and *technological* determinism in favour of a genealogical approach that takes seriously the claim that the relations which constitute both agents and the governmental rationalities, and which shape their conduct, are almost never either purely 'social' or wholly 'technical' or 'natural'. The implications of such an approach for social and political theory are significant, and are considered further in the Conclusion.

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[284] In his comments (personal communication) to me on a previously published article (Rutherford, 1994a) that discussed Foucault's approach to the natural sciences, Rose indicated his reluctance to follow Callon and Latour to the extent of asserting an 'absolute equivalence' between regulatory practices operating on non-human and human entities.

[285] And it should be added, the ways in which various material technologies shape human aptitudes.

Chapter 9

Conclusion: ecological modernisation or governmentality ?

Introduction

Two substantially different ways of approaching the problem of nature emerge from the examination of social theory in this thesis, although there is also a common emphasis in each on the importance of processes of rationalisation. A major difference is evident in the way in which Foucault and those influenced by his perspective (I include Latour and actor network theory here) are inclined to see 'rationalisation' much more in terms of a diverse *multiplicity of rationalities* and governmental technologies. Those influenced by the critical theory tradition on the other hand see rationalisation in more generalised social systemic terms and linked to a view of global processes of modernisation. The latter approach tends to see modernisation as progressing towards some emancipatory form of an idealised democracy, whereas the former is more inclined to an analysis of the ways in which relations of power are shaped by political rationalities which have local, and quite specific concerns.

This difference can be expressed another way by saying that the problem of nature can be analysed within two distinct conceptual frameworks. The first is that of *ecological modernisation*, [286] an approach that is seen most clearly in the work

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[286] I have argued elsewhere that the notion ecological modernisation is a potentially fruitful way of connecting the macro-sociological perspectives developed by theorists such as Beck and Eder, with the recent institutionalisation of specific regulatory practices and policies. See Rutherford (1999a). However, it is necessary to make a distinction between ecological modernisation as a governmental rationality and the term as used here. Here I am referring to ecological modernisation as a social theoretical approach that specifically places the problem of nature at the centre of contemporary processes of modernisation in advanced industrial society. The use I have made elsewhere of the term ecological modernisation reflects what is in effect a technical or governmental program in the sense discussed by Miller and Rose (1992). In that context I use ecological modernisation to describe specific changes which have occurred in the formulation and implementation of enviornmental policies in the 1980s in Western Europe. These changes were a response by environmental agencies to perceptions about the limits of state regulation in achieving improved environmental management. As such this governmental program involved a whole range of policy approaches and instruments aimed at the integration of 'clean production' into economic activities. The institutional transformations that arose from this program resulted in significant changes to investment patterns and production techniques

of Eder and Beck and which draws on a critical theoretical tradition going back to Weber. The second is that of *ecological governmentality*, an approach which I have argued can be drawn from Foucault's work on biopolitics and subsequent works on governmentality, and which is capable of being significantly enriched by the insights of actor network theory.

In this chapter, I summarise the key themes and arguments considered in the thesis. I conclude that by bringing together the work of governmentality studies and actor network theory in a way that extends Foucault's genealogies of power to the natural sciences and associated material technologies, a significant advance over the ways either of these bodies of work are currently employed is possible. Based on this approach, I suggest some directions for future research.

Reflecting these two tasks, this chapter is divided into two main parts. The first reviews the key themes and arguments presented in the earlier chapters of the thesis. The second discusses some of the theoretical implications to emerge for social theory and political philosophy from my discussion of the problem of nature and its relationship to the notions of agency and power. My conclusions are couched in terms of their relevance to the analysis of contemporary ecological problems, but are likely to have a wider applicability to all those areas where science and material technologies play a significant role in the way in which social behaviour is configured.

Key themes

(1) The problem of nature for critical theory

Chapter 2 of this thesis considered how the early Frankfurt School identified what I described as the 'negative dialectic of progress', which pointed to contradictory elements inherent in the growth of reason. Horkheimer and Adorno's critique of the dialectic of enlightenment drew an indivisible link between the domination of the outer natural world by science and technology, and the repression of inner human nature by social institutions and practices. The defining characteristics of modern society were thus cast in terms of the radical separation between subjectivity and nature. This is a theme central to later ecological critique of modern industrial society both in Green theory and, as emphasised in my discussion in Chapter 4, in the recent work of Eder and Beck.

This early critical theory posited a dialectical relationship of the subject to nature, while also rejecting the identity of inner and outer nature. The notion of historicised nature played a central role in the critique of the present, with the

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(particularly in the manufacturing and energy sectors) and in the relationship between the state, industrial interests and environmental groups. See Weale (1992); Christoff (1996)

concepts of history and nature functioning as cognitive tools for such critique - each being employed to destabilise the ontological primacy of the other. As indicated by Habermas, the problem for Horkheimer and Adorno was how the notion of emancipatory reason could resist the generalised critique of modernity, given that the totalising force of reason they saw as inherent to conceptual thinking and language *per se*, and as such inseparable from the domination of the natural and human worlds. The solution to this problem for the early Frankfurt School, not unlike that of the romantic radicalism of some environmentalist movements, was to seek a refuge for emancipatory reason in an aesthetic notion of reconciliation of the two natures.

Habermas rejected Horkheimer and Adorno's rendition of the dialectic of enlightenment and the notion of reconciliation with nature. Despite this, as I have demonstrated in Chapter 3 the problem of nature continues to play a pivotal, although somewhat subterranean role in Habermas' attempt to reconstruct social theory. The core aim of this reconstruction of social theory was to 'rescue' a rational grounding for universal standards of validity and truth, and to avoid their conflation with power in Nietzschean-inspired perspectivalism. As I have argued, while Habermas' theoretical approach changed over time, he nevertheless maintained that it was necessary to distinguish between the logic of instrumental action as applied to our relations with nature, and that of communicative action involved in relations between human agents. Based on this 'differentiation of reason', Habermas argued contrary to Horkheimer and Adorno, that in itself science was not part of the 'dark-side' of modernity but one of its greatest achievements. For him the problem of the social relation to nature (and the environmental problems arising from this) are not caused by the functioning of science as a technological force. To the extent that there is an 'ecological crisis', and Habermas is ambiguous on this, it is caused by the failure of the social system to restrict technical reason to its proper domain (science and relations with nature) and prevent its intrusion into the domain of politics (ie moral-practical reason).

It is therefore clear from my discussion of Habermas' approach to the problem of nature (Chapter 3) that while he argues all knowledge is historically situated, he also retains a conception of science as producing an 'objective' knowledge of the natural world. [287] His criticisms of scientism are directed at attempts to use the model of natural science as an ideological tool of positivist social sciences to justify *social* domination. This stance is reflected in his rejection of the Frankfurt School's critique of instrumental reason, which he

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[287] Of course as I have noted, for Habermas the objectivity of science is not absolute. Interests condition it, but these are primarily the interest in survival of the human *species,* that is, of the 'quasi-transcendental subject'. While this does allow objectivity to be understood as having an historical genesis, he still nevertheless interprets it as a more or less unitary evolution of *the* human capacity.

similarly sees as undermining the possibility of both 'objective' knowledge and social emancipation. By stressing the differentiation of reason Habermas seeks to emphasise the pragmatic utility of the natural sciences on the one hand, while wanting to quarantine politics and ethics from the objectifying logic of those sciences. In this context, I have argued that Habermas' shift to the theory of communicative action meant that his approach became even more anthropocentric. For Habermas, communicative reason is *the defining characteristic of human nature* precisely because it is intrinsic to the evolution of the species as language user.

Despite the shift from cognitive interests to communicative action, Habermas' argument was not substantially different from that he had previously advanced against the early Frankfurt School and his more recent critics who suggested that his theory was too anthropocentric and hence incapable of usefully responding to contemporary environmental issues. Whereas the Frankfurt School saw modern science and technology as central to the domination and suppression of both 'first' and 'second' nature, in the hands of Habermas this is transformed into the relatively unproblematic issues of 'system maintenance' and the aesthetic 'grammar of life'. Chapter 3 therefore concluded that in the end Habermas' characterisation of modern science and technology tends to seriously gloss over the impact these have on the natural environment, and as a consequence, ignores the significance of ecological problems, which are marginalised both for politics and for social theory.

(2) The centrality of ecological problems in Eder and Beck

As I discussed in Chapter 4, both Eder and Beck recognise a 'dark' side to modernisation and in particular the role of scientific knowledge and technology in producing the self-destructive, negative side effects of progress. Unlike Habermas, they see the problem of nature as absolutely central to contemporary social relations and the discourse on modernisation. Both view the social relation to nature as far more problematic than does Habermas, identifying ecological problems as the basis for new social divisions and conflicts.

Each of these two authors argue that social theory must shift its focus from traditional concerns – the political and economic reproduction of society – to include the problems of ecological reproduction (Eder) or the distribution of ecological risk (Beck), which amounts to much the same thing. Key to both Eder and Beck is their understanding of an ecological modernisation that is constitutive of a new type of society, based on forms of social conflict which differ substantially from those which dominated social development in earlier phases of modernity. These new fields of ecological conflict increasingly shape the development of society. For Eder this is centred on competition between different cultural models of the social relation to nature, while for Beck it reflects the

emergence of a sub-politics produced by the systemic shift from problems of wealth distribution to those of the distribution of technically induced ecological risks.

I have argued that the work of Eder and Beck provides a more satisfactory social theoretical approach to the problem of nature than does that of Habermas. Perhaps most importantly the work of Eder and Beck allows us to link social systemic processes with political struggles (particularly environmental ones) that have little place in Habermas' analysis. In particular both theorists provide ways of understanding the roles played by ecological movements, citizens groups and scientific expertise in the emergence of these new fields of ecological conflict. This is one area where the generality and theoretical abstractness of both Habermas and the Frankfurt School is particularly unhelpful.

Eder's work is particularly useful because it provides a subtle and nuanced reading of the role of ecological movements in contemporary environmental discourse and governmental practices, demonstrating that these movements have a deep rooted cultural history embodying both the utilitarian and purity cultural models of the social relation to nature. (see Chapter 4) These movements are often taken as reflecting an anti-modernism, which Habermas identifies with the counter-cultural perspective of the radical new social movements. However, this purity model is never very far from, and constantly interacts with, the utilitarianism and rationalism of modern scientific ecology, as Eder and historians such as Worster (1987a; 1993b) and Grove (1995) have shown. [288] Ecological conflicts, as both Eder and Beck suggest, take on the form of doctrinal or cultural struggles over the appropriate path to modernity, rather than being 'anti-modernist' as such. They reflect, that is, discourses centred on different *rationalities for governing the social relation to nature*.

Similarly, a particular strength of Beck's work is that it points to the way in which both the production and definition of technological risks, and the mobilisation of ecological movements and 'counter expertise', takes place outside the formal political framework. Modern ecological hazards and risks arise as the result of private economic decisions regarding the use of science and technology

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[288] Grove's detailed historical study of the roots of modern global environmental consciousness warrants closer attention than it has received in this thesis. He traces the interaction between the emerging environmental sciences (eg hydrology, climatology, forestry etc) and the practical administration of environmental management in the colonies of the European powers between 1660 and 1860. Of particular importance to the present context is Grove's identification of the interaction between the scientific elites in the colonies and the local 'non-European epistemologies of nature'. New environmental knowledge emerged in these colonial situations and embodied a complex interaction of environmental romanticism and State interests, which often brought together notions of 'moral economy' and 'utilitarian ideals about the desirability of new state structures or roles.'

in the market. Yet while these risks are defined and socially evaluated *post facto* (by experts, the courts, social movements and the media etc) prior decisions are rarely taken at the formal political level about whether or not such risks are acceptable. This is really the central point of Beck's analysis as discussed in Chapter 4 - the formal political system in the West is premised on the strict differentiation of parliamentary politics from the sub-politics of the techno-economic pursuit of interests. Ecological risks (and their associated social consequences) appear as the autonomised, latent side effects of scientific and technological decisions that are not subject to institutionalised political authorisation and legitimation. Beck's point that these decisions are often taken outside of the representative institutions of the State suggests a clear parallel with the sorts of arguments, referred to in Chapter 6, of governmentality theorists Rose and Miller in their analysis of advanced liberal modes of rule.

As Beck is able to demonstrate, these processes lead to three highly significant changes in the character of politics in risk society. First, the established cultural consensus that there is an inherent link between technical-economic development and social progress begins to weaken. Second, the scientifically generated awareness of ecological risks and the hazards of technology gives rise to increasing demands within society for political control and accountability of processes that are to a substantial degree outside the public sphere. Third, there is a breakdown of the notion of the State as a political centre capable of controlling the processes of technological development. Somewhat paradoxically, there is also at the same time (as a result of the heightened awareness and political problematisation of ecological risks) an extension of efforts by the State and others (such as social movements) to monitor and regulate risks. Thus again, as the general approach taken in the work of Rose and Miller would suggest, ecological risks problematise specific forms of 'dangerous' conduct amongst the population, which in turn spurs further attempts (often unsuccessful) to govern these risks.

These processes are analysed by Beck as generating the sub-politics of risk society. There are two sides to sub-politics. The first, which I have just referred to, is concerned with the way in which 'non political' decisions made outside of the formal political institutions have profound political influence on the direction of social change and the choices available to citizens regarding acceptable levels of ecological risk. The other aspect of sub-politics is the emergence of ecological and environmental movements and citizen action groups that represent *centres of counter-expertise*. It is these groups which articulate the demand for greater political accountability and control over the generation of risks. Beck's analysis therefore throws considerable light on the nature of contemporary ecological politics.

Beck's approach it is not incompatible with that of Eder. Indeed, Eder's suggestion that within the environmental movement we can identify both cultural

movements which question the moral-aesthetic relation to nature, and social movements which seek a more ecologically sustainable management of nature, permits a further refinement of the sub-political dynamics of contemporary society. Cultural movements that embody the purity model of the social relation to nature (as found in the Deep Ecology movements for example) are far more likely to question the authority of science, to reject the equation of technical and social progress and to favour life style changes and direct action on environmental issues. Social movements based on the justice model are more likely to be concerned with greater State regulation of economic-technological development in order to ensure a more scientifically based management of the social relation to nature. Such movements are far more likely to accept 'good' ecological science and to engage with the formal political system via lobbying, participation on science-based policy consultative and advisory bodies. [289] Indeed, these latter types of movements and citizens groups often participate in what I describe in Chapter 6 as 'regulatory science'.

I therefore concluded in Chapter 4 that the sort of approach adopted by Eder and Beck is far more theoretically useful than that of Habermas in understanding the relationship between ecological problems and modernisation. It recognises that environmental movements represent a variety of cultural discourses (or political rationalities, to use Foucault's terminology) about the problem of nature and the future direction of societal rationalisation. Such a perspective helps overcome Habermas' inability to satisfactorily link the material reproduction of society at the system level with the actions of ecological movements in a way that does not relegate such movements to the status of irrational, 'anti-modernist' reactions to social complexity.

(3) Biopolitics and the problem of nature in Foucault

Chapter 6 developed the central argument that Foucault's work on biopolitics is very much linked to the problem of nature, or as Foucault himself argued, biopolitics has its origins in the problematisation of the relationship between populations and resources. The element of nature that interested Foucault was that of 'second nature', that is the processes whereby relations of power form modern human subjects. While recognising this, I have argued that there is no compelling reason not to extend Foucault's analysis of biopolitics to the issues of 'first nature' and the way in which this is shaped by, and itself influences, the social relation to nature as represented in the natural environment.

Foucault suggested that the need for the administration of populations and their biological conditions lead to the growth of the human sciences. In Chapter 6,

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[289] See Luke (1999) for an analysis of ecological politics in the United States which draws on the governmentality approach.

I argued that this also gave rise to the problematisation of the natural environment, including the development of the practices that constituted 'the environment' as an object of management and control, and in time, as an object of scientific study in all its (ecological) relations. Indeed, a key theme of this thesis has been that the disciplining of individuals and populations was not possible without the inception of measures concerned with the disposition and regulation of the 'external' conditions of life of the population. I have therefore argued that the more recent development of the science of ecology and the subsequent growth of technical and political interest in the idea of managing the environment should be regarded as an expression or articulation of biopolitics along the lines explored by Foucault. When Foucault talked of the 'entry of life into history' this was precisely because the biological conditions of life and the relationship of these to welfare at the level of the population had become the object of expert knowledges and hence political calculation. This is a process that is clearly extended by contemporary practices for the management of the human relationship to the natural environment.

Foucault and his successors have demonstrated that the emergence of liberalism lead to a re-conceptualisation of the relationship between expert knowledge and government. [290] In a similar manner, I have argued (in Chapter 6) that the role of expert knowledge of the science of ecology has been central to the way in which environments are constituted and managed as dynamic systems. Indeed, the programs of government that have been built around environmental problems in the past 40 years, illustrate the centrality of such ecological expertise in the contemporary attempts at the administration of life. I have suggested that scientific ecology should thus be regarded as providing the basis for the emergence and subsequent institutionalisation of an ecological governmentality. A key proposition of this thesis is therefore that a contemporary analysis of biopolitics must also encompass the forms of ecological governmentality as presented through programs of government that draw on systems ecology and associated sciences of global modelling. The science of ecology and other environmental discourses problematise the social relation to nature and at the same time elaborate programs of environmental intervention and management. Through the sub-politics of natural sciences such as ecology, and the counter expertise and cultural models of ecological movements, 'the environment' has been brought increasingly into the domain of conscious political calculation and made a domain of life which is 'susceptible to diagnosis, prescription and cure by calculating and normalising intervention.' (Rose and Miller, 1992 p.182)

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[290] The work of Rose and Miller (1992); Burchell (1996); and Dean (1994;1998b) is particularly significant in this regard.

(4) Foucault: the incomplete critique of sovereignty

Despite my claims that there are good historical and methodological reasons for arguing that the analysis of biopolitics and governmentality should be extended to the study of the environmental discourse, Foucault himself did not explore this possibility. There is in fact a paucity of Foucauldian analysis of the role of natural sciences, including the ecological sciences.[291] Nevertheless, I sought to demonstrate in Chapter 7 that Foucault's lack of interest reflected important, although largely unexamined theoretical difficulties in his work. One such problem is that Foucault appears to have taken the view that, in contrast to the human sciences, 'the sciences of nature' where somehow able to detach themselves from the social relations of power. This is a view for which he did not provide a satisfactory explanation, other than to suggest it is a function of the degree of formalisation and 'objectivity' such sciences have acquired over long periods of development in the West.

In my consideration of the debate between Foucault and Habermas on power and rationality (see Chapter 5), I argued that contrary to the view suggested by critics such as Habermas and Honneth, Foucault's work was not a general critique of rationality. Rather it was directed at specific social applications of biology (eg medicine) and the human sciences. Nevertheless, I have also presented arguments, in Chapters 7 and 8, that Foucault's philosophical position was not as radical as is sometimes suggested. The most important manifestation of this was the distinction he made between social relations of power and instrumental capacities to 'modify, use, consume, or destroy' things. Power, Foucault insisted, applies to relations between human agents. In this case, then, power cannot apply to the relations between people and non-human things. In his later studies of the processes by which power disciplines and actively forms modern subjects, power and freedom are intimately connected - power in this positive sense presupposes the ability to act on others. Power relations are always dynamic relationships between agents and consequently freedom (as the capacity of agents to act) is an essential feature of such relations.

As I have shown, the difference between power and capacity for Foucault was that 'forces' and 'capacities' act directly on bodies and things, they do not involve mutual adjustments of, and influence on, the actions of other agents. Power involves acting subjects, and this human freedom to act is regarded by Foucault as the 'ontological precondition' of politics and ethics. There is clearly implied in this a basic difference between those actions involving the instrumental manipulation of things, and those of agents or subjects. Implicit also is a further

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[291] For the most substantial attempt to date to apply the insights of Foucault's work to environmental issues, see Darier (1999a).

distinction that assumes there is a fundamental difference between relationships between people and between people and nature. Drawing on the work of Patton I argued that the view of the subject in Foucault's later work was an essentially Nietzschean one, which attributed an underlying potential for autonomy in the subject. One aspect of this autonomy derives from the power for 'self-directed' use of the biological capacities of the human body. Another key element is tied to the Nietzschean notion of the will to power, in which the bodily capacity for action is accompanied by the self-reflexive experience of agency. It is this positive, self-conscious feeling of successful action that is experienced as autonomy. For Nietzsche such self-consciousness, and therefore the capacity to experience agency, is linked to a vital biological interest of the human species in self-preservation – a position that, as I have noted, has parallels with Habermas' cognitive interest theory.

Foucault's later work drew strongly on this underlying conception of subjectivity as the capacity for autonomy. Following Hindess, I argued that the difficulty with this was not the suggestion that domination would be resisted because of the active nature of the subject. Rather, it was that Foucault went further and suggested that the critical role of philosophy was to argue that domination *should* be kept to a minimum. There was thus a shift from the recognition of resistance as one effect of power, to Foucault appearing to set down a universal (or at least potentially universalisable) normative injunction. While Foucault had always at the methodological level rejected notions of generalised emancipation and universal ethical standards, in his last works his comments both on the function of philosophy and on the nature of freedom appeared to resurrect some of the central concerns of critical theory.

For the reasons detailed in Chapter 7, Hindess criticises this as another version of 'the utopian critique of power'. To be consistent with his own analysis of the productivity of power, Foucault must also recognise that some degree of domination and subjectification is necessary for the existence of organised social structures and institutions. I thus argued that Hindess is correct to see Foucault's inconsistency on this question as stemming from an incomplete critique of sovereignty. Foucault fails to fully disengage from the 'modern obsession with the idea of the person as autonomous agent, and consequently, with the idea that a community of such persons can, and should, be governed by consent of its members.' (Hindess, 1996 p.157) Foucault's critique of political sovereignty therefore does not go far enough. Hindess suggests that what is needed is not only a political philosophy that is not built around the problem of sovereignty but also one that frees itself from that other political fiction – 'political community'. My discussion of actor network theory and Latour's criticisms of Foucault in Chapter 8 sought to provide the basis for such a break from the notions of political sovereignty and community.

Further support for the claim that Foucault failed to consistently carry through his critique of sovereignty is provided by my discussion of the work of Rouse. This demonstrates that despite Foucault's reticence to apply his critique to the established natural sciences, there is a strong argument that do so would be both possible and consistent with his general analysis of the relations between power and knowledge. In fact, Foucault's general genealogical approach not only problematises any notions of an essential human subjectivity, at the same time it also challenges traditional concepts of representation and action. Hence Foucault can legitimately be taken to task and asked why any assertion of a strong epistemic or political distinction between nature and society should not be subject to the key critical question underpinning his work in general. [292]

It is therefore reasonable to suggest, as Rouse has done, that Foucault's critique of political sovereignty should both logically and methodologically be part of a wider critique of epistemic sovereignty. The sorts of objections Foucault raised against political sovereignty also apply to questions of epistemic sovereignty, in that both ignore the multiple and local micropractices of power that produce both organised scientific discourse and define their objects of study. A key conclusion of this thesis therefore is that Foucault's incomplete critique of sovereignty explains why he made a distinction between capacities exerted over non-human things and relations of power among acting human subjects. It also helps explain why the natural sciences which take as their object the study of non-human nature, were seen by him as capable of detaching themselves from relations of power.

(5) Latour: the critique of modern representation

In Chapter 8, I argued that the approach of Latour and actor network theory to agency provides a crucial insight into how the *natural* sciences can be analysed in a way that is generally consistent with Foucault's approach to biopolitics and the recent work of others on governmentality. One of Latour's major criticisms of both contemporary science and technology studies, and social theory in general is their failure to recognise that in modern societies many of the most *efficient* sources of power come from the sciences and not from the traditional political process. To the extent that Foucault treats natural science as able to free itself from relations of power, Latour's criticism can also be directed at Foucault.

I demonstrated in Chapter 8, that it is possible to draw on Latour's work to explain how the natural sciences are able to exercise what Foucault described as the 'the centralising powers which are linked to the institution and functioning of

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[292] That is, 'in what is given to us as universal, necessary, obligatory, what place is occupied by whatever is singular, contingent, and the product of arbitrary constraints'? See Rouse (1993) p.138-9.

an organised science in a society such as ours.' (Foucault, 1980e p.84) Latour's analysis points to three main factors that are responsible for these 'centralising powers' of the natural sciences. First, the practices of modern science render any inside/outside boundary between 'science' in the laboratory and the 'society' outside arbitrary and deceptive. Modern science, which by its very nature is applied techno-science, systematically dissolves this distinction. In order to function, science must capture the interests of allies, that is, must be able to 'translate' scientific statements so that these are framed in terms which problematise their development and application for economic and social interests beyond the laboratory (eg companies, interest groups, government agencies, etc). Second, by partitioning and disciplining micro-phenomena in the laboratory, science is able to invert the micro/macro levels of social theory. Simplification and scaling down in the laboratory produce a change of scale which makes possible a reversal of the actor's strengths so that what was formerly overwhelming in 'the field' can be made manageable and manipulable. Third, through the processes of inscription, science is able to build powerful *centres of calculation*. Only through inscribing vast quantities of information and data in a form that can be measured and compared, can the objects and phenomena of science (ie 'nature') be rendered manipulable. When combined with the change of scale referred to above, the laboratory is at the centre of a network through which information is gathered and inscriptions generated, combined and condensed. Those inscriptions are then re-dispersed and inserted in the practices of the world 'outside' the laboratory, but only to the extent that the wider society itself is first reconfigured and disciplined in ways which permit the reproduction of the contrived conditions of the laboratory. In this process science builds centres of calculation that mobilise resources scattered across numerous and diverse networks, and becomes capable of acting at distance on hitherto unfamiliar events, locales and actors.

Foucault regarded the natural sciences as too problematic, involving questions about the link between scientific knowledge and power that were 'excessively complicated' and in which the 'threshold of possible explanation (is) impossibly high.' (Foucault, 1980d p.109-10) As I have shown in Chapter 8, what Latour calls centres of calculation can be seen as extensions of Foucault's notion of the *dispositif*. However, in extending Foucault's approach to the 'hard' natural sciences, Latour's work directly undermines the very reasons put forward by Foucault for not studying the connection between these 'highly formalised' natural sciences and power relations.

I argued in Chapter 7 that one reason Foucault was not able (or willing) to advance beyond the view of the natural science as 'detached' from power was that despite his anti-humanism, he remained tied to the ideal of human autonomy. His focus on the critique of the human sciences reflected his underlying view that it was these and the disciplinary practices they imposed upon human agent, which

potentially most threatened that autonomy. Latour and his colleagues however are able to show that those scientific activities that sociology and social theory (including Foucault's) have deemed 'irrelevant or too technical' are in fact one of the most efficient, new sources of power in modern societies, precisely because they appear so technical and remote from 'politics'. Latour's work makes it clear that it is science's abstract and complex networks of translation that allows it to become so powerful. This is because the 'abstract', formalised sciences are able to occupy strategic positions within extended translation networks, by establishing 'obligatory passage points' that successfully tie social and technical resources together. Thus the ability, noted by Foucault, of the natural sciences to invest particular discourses (and those who engage in them) with a special power and authority rests on the way in which scientific spaces (eg laboratories) occupy these strategic centres. It is from these spaces or centres that scientists (perhaps quite unwittingly) engage in practices that 'can displace society and recompose it by the very content of what is done inside them.' (Latour, 1983 p.168)

In Chapter 8, I also discussed Latour's specific criticisms of Foucault. The most significant of these is related to Latour and Callon's methodological principle of general symmetry, which cautions against assuming agency is necessarily a uniquely human characteristic. This approach is intended to problematise the representation of subject and object as ontologically distinct classes of being. It recasts agency as a property of hybrid entities composed of social and technical elements, thereby undermining any implication that this is necessarily or exclusively a human characteristic.

As I have emphasised, a key result of this is that the notion of agency does not provide, nor should it be intended to provide, a model of human subjectivity or even a description of minimal human competences. Rather actants are seen both as possessing the ontological characteristics of a network, and as the product of the semiotic work of heterogeneous processes of translation, attribution, and problematisation within networks. Actor network theory therefore shares with Foucault the view that relations of power and the capacities for action accompanying those relations define the actor. However, it carries the assumptions about the types of historical and discursive work needed to constitute an entity beyond those bearing on human subjectivity and agency, and extends this approach to anything capable of being the source of an action. One key consequence of the application of the principle of generalised symmetry is thus that the distinction made by Foucault between passive things and active human subjects is highly problematic. Thus rather than a separate nature and society, it is preferable to see these as constituting a 'socio-nature' composed of the hybrid entities produced by translation networks.

The principle of generalised symmetry can be applied to the analysis of the notion of modernity itself. As Latour argues, what we understand as 'modern' is based on the philosophical division of representation. Latour however shows that

what we call 'modern' consists of two different sets of practices - the processes of translation which gives rise to socio-technical networks and hybrids, and the practices of 'purification' that create and enforce the ontological separation of human from non-human. This second set of practices corresponds to what Latour describes as the 'modern critical stance'. As my examination of Habermas in Chapter 3 demonstrated, maintaining this philosophical division of representation is fundamental to his defence of modernity. It is also in these practices of purification that we see the grounding of Foucault's position on the difference between the human and natural sciences. As I argued in Chapter 7, Foucault's failure to extend his critique of political sovereignty to a broader critique of epistemic sovereignty is closely connected to his apparent belief in the solidity of the natural sciences and their ability to detach themselves from power. It is also connected to his identification of the human subject's capacity for autonomy as fundamental to power and agency.

The actor network theory critique of the modern dichotomy of representation also calls into question the ideal of political community, which Hindess identifies as the other key modern constitutive fiction. Such a radical critique of the modernist notions of representation and agency, if accepted, clearly would have far reaching implications for how we understand politics and power. In the final part of this chapter, I therefore consider the implications of the conclusions of this thesis for our understanding of the problem of nature and ecological politics.

Ecological modernisation or ecological governmentality?

What can be said about the implications of the theories examined in this thesis for our understanding of the problem of nature? Habermas' critical theory seeks to impose a far too artificial and rigid separation between modes of rationality and action. Beck, while working in an idiom that is far from alien to that of critical theory, is in many respects highly critical of Habermas. Nevertheless, as useful and thought provoking as Beck's analysis of risk society undoubtedly is, in the end he does not venture significantly beyond the task Habermas had set for himself. Habermas' objections to Horkheimer and Adorno's critique of instrumental reason and the dialectic of enlightenment are at their core directed at completing the 'unfinished project of modernity'. This is a project that for Habermas means carrying the processes of rationalisation forward so that all realms of social action are subjected to the rule of reason.

Beck's critique of risk society is far more attuned to dealing with the problem of nature than is Habermas'. Beck seeks an 'ecological enlightenment' based on the understanding that the simple modernity defended by Habermas is in the process of being transformed into a qualitatively new reflexive modernity, in which the relation to nature has become central to both further modernisation and to social theory. However Beck appears more radical in his diagnosis of the

symptoms of the problem than in his proposals for dealing with this. His analysis of science and technology does not significantly go beyond that given by Habermas several decades earlier. In particular, this is evident in the way Beck is critical of the role of science and technology because it leads to *unseen*, autonomised social changes. He is critical of this precisely because it imposes social change that is not legitimated by political discourse and democratic decision-making.

Risk society is for Beck based on a 'category error' in which the technological verification of hazards simultaneously excludes proper recognition of the social genesis of those hazards. (Beck, 1995b p. 110) Of course Beck sees in reflexive modernisation an immanent basis for the overcoming of this problem. Yet his solution is not one that goes beyond the Habermasian concern for the revitalisation of the public sphere and the rejection of scientism and technocratic consciousness, which Habermas argues, transforms science and technology from a progressive force into ideology and an obstacle to emancipation. (Habermas, 1971) Thus Beck insists

> Only by breaking the law of unseen side effects, by elevating decision making on technologies to public and political processes before and during the genesis of hazards, can we return the fate of the hazard civilisation to the realm of action and decision making. We must reverse the prevailing practice of developing and financing new technologies first, and then investigating the effects and hazards, and finally publicly discussing them under the guillotine of manufactured objective constraints. (Beck, 1995b p.110)

He thus argues for institutional responses that will bring this autonomised technological change into the realm of a democratic and discursive decision making. He suggests that we need a public, deliberative forum – 'perhaps a kind of 'Upper House' or 'Technology Court' that would guarantee the division of power between technology development and technology implementation.' Such processes, while not abolishing conflict and guaranteeing consensus, he hopes could at least 'practice and integrate ambivalences, as well as revealing winners and losers, making them public and thereby *improving the preconditions for political action*.' (Beck, 1995b p.29-31 – emphasis added) In other words, what Beck is concerned with is precisely the revitalisation and extension of the *political sovereignty* of those affected by technological change.

It will also be noted that Beck is effectively calling for the 'proper' separation of technical rationality from political decision making about the applications of science. As I indicated earlier, he also dismisses the notion of a new ethical relationship to nature. He is therefore not that far from Habermas when it comes to his views on how to deal with the problem of nature. The issue for Beck, just as it is for Habermas, is not an *excess* of rationality as suggested by Horkheimer and

Adorno. Indeed, Beck claims that the problems of risk society can be cured 'not by a retreat but only by a radicalisation of rationality, which will absorb the repressed uncertainty.' (Beck, 1995b p.33) It is important however to recognise that Beck is not simply talking of the creation of formal institutions which would give form to the reflexive re-invention of politics. Risk society gives rise to a 'life-and-death politics' that permeates everything from the most global ecological problems to the inner most depths of private life. (Beck, 1995b p.44-7) [293] Indeed, Beck argues that the 'ecological culture' of risk society undermines the apolitical character of the private sphere. Hence while we can see clear parallels with Habermas, we can also see others which reflect elements of Foucault's diagnosis of biopolitics.

Beck points to the collapse of the traditional ideals of scientific rationality, in which there is a distinction between 'basic' or 'pure' research, and 'applied' science and technology. A 'new type of manufacturing tinker-science' has replaced this traditional model of science, according to Beck. He argues that in this sort of science, the spatio-temporal relationship between experiment and application has been reversed, so that experimentation is exported beyond the laboratory and 'society is made into a laboratory'.[294]

This may superficially appear to echo the view put forward by Latour, however it reveals a key problem in Beck's approach. Rather than advancing a view consistent with Latour, Beck is in fact making one of the mistakes Latour cautions against; that is, Beck's analysis assumes the 'inside/outside' distinction between laboratory and society. Hence, Beck is mistaken to see this 'reversal' of experiment and application as a fundamental feature of a new type of science. Rather, as Latour and Callon demonstrate, this has always been an essential feature of modern science ('techno-science'). What is probably true is that the problematisation of the ecological and bio-technical consequences of this type of science has increasingly rendered the myth of the separation between laboratory and society untenable. Beck is of course correct when he suggests that the undermining of the 'ideal' of traditional science 'opens the door to public disputes, fears, and viewpoints' which call into question the objectivity of science. (Beck, 1995b p.105)

As I have suggested, Beck's work in key respects suffers from the same underlying totalising approach to rationalisation, as does that of critical theorists such as Horkheimer, Adorno and Habermas. In Beck's analysis of reflexive

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[293] See also Beck's (1992b, Part II) detailed treatment of how risk society individualises gender, family and labour relations.

[294] For example, he argues that 'Nuclear reactors must be *built*, artificial biotechnical creatures must be *released into* the environment, and chemical products must be *put into circulation* for their properties, safety, and long term effects to be studied.' (Beck, 1995b p.104)

modernisation this leads to an overly generalised view of risk, and a tendency to portray risk as operating fairly much in the same way across contemporary technological society regardless of the specific sectoral or national context. His analysis of the emergence of a new stage of modernisation is premised on the assertion that the advent of ecological 'mega-risks' makes risk *incalculable*, and consequently, all attempts to calculate and manage the costs of these become technocratic obsfucation.

However, as Dean (1998b) has very clearly demonstrated, the problem of the calculability of technological risk is far more usefully approached within the conceptual framework of governmentality. Thus, he emphasises the importance of directing our attention to analysis of 'the specific form of risk rationalities' rather than engaging in 'a global narrative of risk society.' He suggests four dimensions to the government of risk, and indeed, I would argue that it these questions which should form the starting point for any future research which seeks to understand the ways in which environmental risks are linked to the formation and articulation of ecological governmentality. Dean frames the key questions that should be asked of 'risk' as follows:

> First, how we come to know about and act upon different conceptions of risk, ie the specific forms of risk rationality. Second, how such conceptions are linked to particular practices and technologies. Third, how such practices and technologies give rise to new forms of social and political identity. Fourth, how such rationalities, technologies and identities become latched onto different political programs and social imageries that invest them with specific ethos. (Dean, 1998b p.32)

In contrast to Beck, Latour's approach has the considerable merit of extending the sorts of critical genealogical questions posed by Foucault to our attempts to understand the interaction between the human world and non-human nature. Latour's call for the abandonment of the ontological bifurcation of the 'modern constitution' appears to open up the possibilities of some form of political representation for nature. It is thus possible to see Latour as providing a strong social theoretical perspective that has generally been lacking in Green political thinking. However, neither Green theory nor Latour overcome the problem of humans speaking on behalf of the non-human. If determining who can legitimately speak for whom is a problem in human societies, it is doubly problematic for non-human entities who can only 'speak' through the inscription media of a human constituted natural science. It is perhaps unfair to expect Latour to respond to this problem, despite his rhetoric about the 'Parliament of Things', for in reality it probably makes little sense to speak of a political community that includes nature. Of more significance is Latour's emphasis on a broader 'collective' or 'hybrid' view of agency. By calling into question any simple correspondence between speaking human subjects and agency Latour's work opens the way for a view of power which is far more nuanced and thus receptive

to extending the sorts of analysis developed by Foucault to those areas, including the environmental, in which science and technology play a central role.

It seems to me that nothing is lost and much may be gained by adopting the perspective of actor network theory, and saying that in many instances it is not particularly helpful to assume that it is *only* people who act or exert power. This theme is implicit in my critique of Foucault, for while his characterisation of government as the 'conduct of conduct' is undoubtedly a powerful analytical turn, it is nevertheless arbitrarily self-limiting if we always take this to refer to only the actions of persons on others. I have been critical of Foucault (and by implication, of those who have taken up aspects of his work) for not paying sufficient attention to the role of the natural sciences in shaping power relations. I have attempted to argue that this is not so much an ontological question about the objects of study of the human versus the natural sciences. Instead it is a question of the extent to which particular forms of knowledge (and associated governmental practices) bear upon the realm of positivity – which today is shaped by ecology, molecular biology and atmospheric physics as much by the human sciences. [295]

The substantial merit of taking the actor network theory approach seriously, and hence adopting Callon's methodological principal of generalised symmetry in the study of the problem of nature, is that this allows us to reflect critically on a particular form of relation to nature rather than being compelled to unreflectively work within the limits set by a view of nature taken from the natural sciences. It seems clear that if the social relation to nature is understood along the lines suggested here, then we must also take seriously the proposition that not only are we, as Tully (1997) says, 'partly constituted as subjects acting on nature in (the) complex practices of knowledge, power, ethics and technologies', but also that such practices constitute the nature we act upon. This in turn requires that we give appropriate weight to the ways in which the non-human world (both nature and material technologies) is a repository of capacities that are significant resources for the translation networks and centres of calculation that are integral to the power of modern science.

One consequence of extending this sort of analysis to the natural sciences is that the processes of thematisation, discipline and normalisation must be seen to be as much a part of our knowledge of, and relation to, nature as they are in the human sciences. The natural environment has increasingly become the subject of political rationalities, which have not only altered the ways in which its 'reality' is conceptualised, but also generated a complex array of moral and political justifications for the proper disposition of authority and government. Such a view is not inconsistent with Foucault's project of understanding power and its

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[295] I am indebted to Nikolas Rose for articulating this distinction in his comments to me on an earlier published work (Rutherford, 1994a).

production of truth, even when extended to the natural science. In arguing thus I have draw on the work of Nikolas Rose and Peter Miller on governmentality. Governing conduct is linked to political rationalities, which make the domain to be governed intelligible and susceptible to strategic (including moral) action. [296] Such rationalities are brought to bear on conduct through governmental technologies. Rose suggests that such technologies should be regarded as 'an assemblage' of a range of forms of practical knowledge, practices of calculation, human capacities and *non-human objects and devices*, including inscription devices. (Rose, 1999 p.52 – emphasis added)

Rose views such technologies of government as 'human' technologies, and argues counter to the Frankfurt School, that it is meaningless to counterpose human freedom to technology simply because 'freedom is the mobile outcome of a multitude of human technologies'. Yet despite this, Rose appears reluctant take the broader view of power suggested by authors including Latour, Callon and Rouse. His view of the inventiveness of science appears to remain overly tied to the experimental methodology of scientists *within* the laboratory to the neglect of how this is only ever of lasting significance to the extent that is able translated *outside* the laboratory. Rose and Miller draw on Latour and Callon's notions of inscription devices and translation networks (and the role of these in enabling 'action at a distance') as central to neo-liberal modes of rule. Given this, and Rose's (1999) recognition that even material technologies involve 'a certain shaping of conduct', it must be said that Rose has not presented a clear argument as to why the actor network theory position on agency should be *unacceptable*. [297] If it is accepted that a rigid separation cannot be made between those elements of governmental technologies that rely on non-human capacities, objects, and devices, and those whose elements are social, then it is difficult to see why agency cannot be attributed to 'hybrid' actants as suggested by Latour.

At a general level, despite his reluctance to develop conceptually his fairly scattered comments on the natural sciences, Foucault could clearly be said to regard discipline and biopolitics as mechanisms by which otherness was thematised, problematised and brought into the realm of normalising calculation. Indeed, Foucault cautioned that

> We must not imagine that the world turns towards us a legible face which we would have only to decipher; the world is not the accomplice of our knowledge; there is no prediscursive providence which disposes the world in our favour. (Foucault, 1981d p.229)

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[296] See Rose (1999) p.15-60 for a detailed exposition of 'governing'.

[297] I have posed a similar question in a review of Hindess' recent work. See Rutherford (1997b).

It is in comments such as this that we see the common threads between Foucault's work and that of Horkheimer and Adorno, who argued that in Enlightenment thinking the 'mere idea of outsideness is the very source of fear'. (Adorno and Horkheimer, 1986) It is here that we can understand the link between rationalisation, discipline and normalisation. Foucault (1990 p.142) argued that the emergence of biopolitics coincided with the modern scientific thematisation of life, making for the first time in history what was formerly the 'inaccessible substrate' of human life an object of power. Scientific objectification, whether of the human body or non-human nature problematises that otherness which threatens to escape governmentalisation and normalisation. Foucault often emphasised that problematisation and discipline were the products of specific rationalities. There is in Foucault recognition of what could be described as the dark side of the thematising project and of reason more generally. [298] However, the problem is not the same one identified by critical theory (and Green theorists) [299] as that of excessive instrumental rationality. As Jane Bennett has pointed out, it is 'misleading to reduce the problem to instrumental rationality (as) each and every categorical organisation, however expressive or anti-instrumental, will be exclusionary in some way.' (Bennett, 1987 p.145) Such a view is not that far from Horkheimer and Adorno's treatment of 'identity thinking' in Dialectic of Enlightenment. [300]

The effect of the scientific thematisation of nature is taken up by Beck. He claims that the further differentiation of industrial modernity in risk society means that nature no longer retains its 'pre-ordained character' and has become part of the 'inner nature' of post-industrial society. He argues that the meanings of 'nature' and 'society' are re-thematised and integrated into a 'social-nature'. In the process nature is appropriated to political functions:

> 'Nature' becomes a social project, a utopia that is to be reconstructed, shaped and transformed … and (this) makes the production of matters and bodies of fact possible (and) … produces a world of living creatures which can conceal the manufacturing character it creates and represents. (Beck, 1994 p.27)

Ecological problems and environmental movements are therefore as much involved in the thematisation of nature, as are the economic and technical forces

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[298] It is this side of Foucault's work that Habermas and Honneth seized on when attributing to him a view of a disciplined society, similar to Horkheimer and Adorno's 'totally administered society'.

[299] See Eckersley (1992) and Chapter 2 of this thesis.

[300] See Rutherford (1993) and Luke (1988) for discussion of how expressivist forms of environmentalism, especially 'deep ecology', seek a new subjectivity modelled on an uncritical acceptance of ecological constructs..

of advanced industrialism. As Beck emphasises, such movements and problematisations, while they appear to call for the 'salvation of nature' in fact 'accelerate and perfect' the consumption (of nature)'. (Beck, 1994 p.27) The problem is that Beck is unable to explain how this is brought about.

Latour's critique of the modern bifurcation of nature and society points in deliberately Foucauldian terms to the need for a new 'political constitution of truth' which would recognise the hitherto denied and subterranean production of socio-natural 'collectives' and 'hybrids'. What this involves is not simply the recognition that the realm of positivity is in fact a tangle of the human and non-human. Rather Latour sees this as also very much a continuation of the democratic spirit of the Enlightenment, and specifically asks, 'Is it not worth the effort to pursue the Enlightenment into the dark tangles of science and society mixtures?' (Latour, 1991 p.18) For him this is a question of creating, along the lines suggested by Foucault, a new regime of truth and a new anthropology appropriate to the task – a task involving the intellectual disciplines of political philosophy and science studies.[301] He insists that this does not require a 'revolution', only the public ratification of what has always in fact happened in practice but has been denied by modern epistemology.

However, this claim that all that is needed mere 'ratification' is not as simple as Latour's presentation of it suggests. Even if his argument for the hybridisation of social and natural entities were accepted, the call to bring Enlightenment to bear on the entities of socio-nature would carry the process of thematisation and objectification to a new level of intensity. Latour's 'Parliament of Things', the recognition that power and agency inhere in networks composed of human actions and material capacities of things, requires on his account a further extension of the

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[301] Dean argues that despite the commonalities between actor network theory and Foucault, the two part company because authors such as Callon and Latour adhere to a particular variant of realism which focuses on the way in which socio-technical reality is *constructed*, whereas Foucault adopts a far more *nominalist* approach which refrains from pronouncing on the nature of social reality. Foucault's methods, argues Dean 'arise once we examine the full consequences of what we might call "the social construction of knowledge" while abstaining from providing an alternative account of reality (the reality of subjects, of society, of humanity).' Hence, what is at issue is in fact 'the realm of effectivity of the construction of truth.' Nevertheless, Dean argues that there is a limit to Foucault's nominalism, that he 'refrains from the inference that everything is thereby a construction. Yet at the same time the real 'remains too indecipherable ever to be able to be summed up into a formula (a theory of the subject, of power, of a constructed object, a realm of facts, a network, a social reality). … This is Foucault's irrealism, his agnosticism. (Dean, 1998a p.193-5)

Space does not permit an excersus into the philosophical debates on realism and constructivism. However, I am not convinced by Dean's argument on this issue. I think that he overlooks the degree to which actor network theory is compatible with the sort of nominalism attributed to Foucault. In any case, I do not see the approach taken by Callon and Latour as a *realist* one. I am more comfortable with Rouse's position, which is "against realism *and* anti-realism". On this see Rouse (1987).

dividing practices and scientific classification that Foucault's work pointed to as central to modern power/knowledge. Thus, Latour says that we need

> The meticulous sorting of quasi-objects to become possible – no longer unofficially and under the table, but officially and in broad daylight. In this desire to bring to light, to incorporate into language, to make public, we continue to identify with the intuition of the Enlightenment. But this intuition never had the anthropology it deserved. (Latour, 1993 p.142)

As Foucault and others have shown, the other side of such thematisation is problematisation, programs of government, normalisation and discipline. The way in which such programs of ecological governmentality would play themselves out is not something to which Latour pays much attention. His approach does however suggest something of a celebratory proliferation of hybrid diversity. There is no doubt that the processes of translation and relations of power analysed by actor network theory would not be abolished by abandoning the modern constitution. Indeed, there is in what Latour says no suggestion of the abolition of power. However, his rhetoric regarding a 'Parliament of Things' confuses, perhaps deliberately, different meanings of representation so that recognition of the actor-network qualities of agency is not disentangled from notions of political sovereignty. The value of Latour's critique of the modern constitution is that it undermines any arbitrary division of representation between human and non-human entities. This critical genealogical approach makes 'no *a priori* distinction between the size of actors, between the real and the unreal, between what is necessary and what is contingent, between the technical and the social.' (Callon and Latour, 1981 p.292) This is particularly important when the realm of positivity in question is the ecological. In such circumstances it focuses attention on the ways in which capacities and power are aggregated, through centres of calculation, to act across complex assemblages of political (both institutional and sub-political), scientific, economic, ethical, and technological practices at both the local and global level.

All of the theoretical approaches considered in this thesis lead us to consider the ways in which modern scientific knowledge and expertise shapes the distribution of power and the social relation to nature. Foucault's insistence that we understand particular institutions and accompanying relations of power as the result of historically specific political rationalities, rather than as the result of some generalised (and totalising) process of societal rationalisation is an important corrective to that tendency in theorists such as Habermas and Beck. Foucault's notion of biopolitics can, as I have argued, be linked to the emergence of contemporary scientific ecology as a mode of regulatory science. This is not to suggest that contemporary environmental discourse is a unity, much less that it reflects the triumph of technical or instrumental rationality in general. Instead, the more limited suggestion has been made that the ecological sciences (such as systems ecology) and projects such as the International Biological Program can be

understood as a form of political or governmental rationality. Systems ecology is one such rationality among a plurality of rationalities, even within the domain of environmental discourse.

If this governmentality approach is applied to Eder's work, for example, it suggests that what he calls the 'purity' or romantic model of nature has been very much a marginalised rationality in Western culture and politics. Nonetheless, historically it has interacted with and influenced the expression of the dominant rationality, the utilitarian or 'justice' model of nature. Something similar can be found in Beck's notion of sub-politics, in which he argues that risk society produces discourses about the generation and distribution risk that increase opportunities for social movements and counter-experts to help shape contemporary society 'from below'. Latour and Callon also show that socio-technical action at the local level (in the laboratory, the factory or on the farm) and at the macro-level of the 'social system' is not fundamentally different. In each case it is rather a question of local actors making themselves 'bigger' and more powerful by extending the reach of translation chains and enrolling the resources of allies, and by occupying obligatory passage points or centres which channel translations and resources to enhance their strength. As Rose points out, what is at stake in all of these sorts of struggles are not contestations 'between power and its others, but between diverse programs, logics, dreams and ideals, codified, organised and rationalised to a greater or lesser extent.' (Rose, 1999 p.279)

The similarity with Foucault here is obvious. Foucault argued that a power relation is 'an agonism', a 'permanent provocation'. Power relationships are dynamic and therefore always potentially unstable. Consequently, under particular circumstances, even long-established states of domination may be subject to reversal. Thus Eder's purity model and aspects of Beck's sub-polity can be seen as resistance to the dominant, scientised understandings of nature, or what Foucault described as an 'insurrection of subjugated knowledges', those 'naïve', 'disqualified', localised, non-scientific discourses which oppose the 'tyranny' of particular globalising scientific disciplines. (Foucault, 1980e p.81-5) However, the point in making such a contrast is not to counterpose, in the style of Habermas, modern, rationalised knowledge to anti-modern, irrational forms of belief, which are thereby devalued and excluded. Indeed, perhaps Foucault's comments on 'resistance' betray a lingering valorisation of the autonomy and sovereignty from which I have argued he failed to fully break. Perhaps, as Rose suggests, there is no need for a notion of resistance. Rather we may need to think simply in terms of the dynamic 'ways in which creativity arises out of the situation of human beings [302]engaged in particular relations of force and meaning,

[302] Or indeed, of any 'actant', not only human ones.

and what is made out of the possibilities of that location.' (Rose, 1999 p.279) Foucault of course saw identification with the resistance of 'disqualified' discourses as a practical genealogical task aimed at establishing 'a historical knowledge of struggles' which could be made use of tactically in contemporary political and social contests. (Foucault, 1980e p.83) No doubt there are many disqualified and subjugated knowledges where this is appropriate, yet it is also relevant to recall Hindess' comment that organised social existence (and the freedoms that this provides) is not possible without some degree of domination. It is arguable that in environmental matters, some forms of domination may be particularly important if both humans and other species are to enjoy certain basic ecological 'rights to life'. This however touches on the issue of an environmental ethics – a task beyond this thesis. [303]

The focus of this thesis suggests that a research agenda into ecological problems is likely to have much to gain from drawing on the work of both governmentality studies and actor network theory. While I have commented above on the role of environmental movements, the study of environmental discourse cannot be concerned solely, or perhaps even principally, with the struggle between scientific and non-scientific rationalities. It would also need to examine the competition and manoeuvring *within* scientific ecology itself (ie between systems ecology and population ecology, community ecology, etc), and to consider how these apparently esoteric, technical debates influence the historical formation of the regulatory sciences and ecological programs of government.[304] This thesis has argued that the development of scientific ecology, particularly systems ecology, provided both a guiding political rationality and the technical apparatus of calculation and assessment that by the late 1960s began to make possible a form of regulatory science that was capable of governmentalising society-environment relations.

A need exists for substantial further research into the ways in which the ecological research institutions (particularly in the United States, but also in other countries) developed as centres of calculation able to translate their emerging research interests into key elements of the new rationalities of ecological government. Such historical research would seek to explain how scientists were able to make the technical agendas of ecology the cornerstone of powerful alliances with conservation groups, political executives, legislatures and State agencies to create new regulatory regimes focused on the problematisation of the environment and the social relation to nature. The role of the USA has been

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[303] For some recent and very interesting attempts to consider what an environmental ethic informed by a Foucauldian perspective might involve (and not involve) see Darier (1999b) and Tully (1997).

[304] For some excellent historical studies of the conflicts within scientific ecology in the post-World War 2 period see Mitman (1988); Palliadino (1991) and Taylor (1988).

significant, inasmuch as it was the first place that saw the emergence of contemporary industrialised 'big science'. This was initially very much influenced by national characteristics. However, given the transnational character of scientific research agendas (eg the International Geophysical Year and the International Biological Program), and the hegemony of US science in much of the post-World War Two period, there is evidence of a widespread (but by no means universal) internationalisation of ecological techniques (eg Environmental Impact Assessment) and ecological theories originating in the USA. [305] How these 'laboratory' developments were translated both nationally and internationally, and were aligned with economic and social interests requires further investigation.

While the focus of many governmentality studies has been the practices of government within the context of particular nation-states, actor network theory provides useful conceptual tools to look at scientific networks that extend beyond such boundaries. It is important not to over-emphasise the nation-state and national cultures at the expense of analysing the problematics of government in a way that gives appropriate weight to the global (or at least transnational) assemblages of forces and networks of authoritative scientific-policy judgement that can have a significant influence on shaping contemporary social relations. Included in this would be consideration of the role of international organisations, and the link between science and international environmental policy (eg ozone depletion, climate change etc.).

Dean has argued the Foucauldian concern with the 'problematic of government is not so much a solution to the paradoxical nature of the state but a research agenda into the contingent trajectories by which the state assumes its present and changing form'. (Dean, 1994 p.181) As ecological problems demonstrate, that form is increasingly one in which national structures are overlaid by international patterns of governance which embody processes of both marketisation and regulation, and which rely on expertise and knowledge that is to a significant degree denationalised (if not globalised). In the context of ecological problems, it is therefore important to try to unravel the relations between such denationalised scientific expertise on the one hand, and on the other, the political rationalities and various governmental programs for ecological management conceived in terms of a global, systemic interdependence between society and nature.

The many apparently contradictory elements of environmental discourse (scientific, economic, ethical, cultural, etc) can be understood in terms of the

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[305] For detailed discussions of the influence of US science on the growth of contemporary ecological theories, see Golley (1993); Jamison (1993) and McIntosh (1985). For detailed consideration of the political institutionalisation of environment protection in the USA, see Harris and Milkis (1989); Jasanoff (1990); (1992) and Marcus (1991).

notion of governmentality. The significant work of Rose and Miller (1992) on this has identified three key characteristics of governmental rationalities. If the discourse on the problem of nature is considered in the light of these three elements, we can move beyond the general assertion that both ecological modernisation and counter-cultural resistance are immanent in modernity, and instead begin to consider how and why these elements fit together in contemporary practices for governing the environment.

According to Rose and Miller (1992 p.178-82) governmental rationalities are characteristically moral, epistemological and idiomatic. They are expressed in moral terms that elaborate the ideals and principles with which government should properly be concerned. Ecological governmentality is particularly concerned with questions of justice and equity – questions such as inter-generational equity, the relation between development and environmental protection, and the relations between the needs of human society and the biotic rights of non-human nature. Thus a significant element in the environmental debate is the concern to develop an appropriate environmental ethics. Governmental rationalities also have an epistemological character. They are articulated in terms of a specific knowledge of the objects and problems to be addressed. This epistemology is in large part derived from scientific ecology, which as I argue in Chapter 6, represents an essentially economic model of nature.[306] It is scientific ecology (and related sciences of global environmental modelling) that provides the authoritative accounts of the sorts of entities and processes which must be managed – ecosystems, global climatic and atmospheric processes, habitat and species diversity, population and carrying capacity, and so forth. Finally, all governmental rationalities are expressed in a distinctive idiom, which functions as an intellectual means for making reality 'thinkable in such a way that it is amenable to political deliberations.' (Rose and Miller, 1992 p.179) Hence the relationship of society to the natural environment is conceived in terms of the language of security and risk (or ecological *crisis*). Ecological hazards and insecurity are characteristically posed as problems that must be addressed through governmental technologies that minimise dangerous behaviours and the risks to which they give rise. The idiom of ecological rationality is paradigmatically represented by 'the precautionary principle', [307] which reverses the onus of scientific proof to insist that practices and actions cannot be deemed safe simply because there is not scientific certainty of the potential for environmental harm.

Government, as the conduct of conduct is inherently a problematising activity in which the 'articulation of government has been bound to the constant

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[306] On this see Worster (1987a) and (1993a).

[307] This is was clearly enunciated as the key principle of sustainable development in the famous "Brundtland Report" (Brundtland, 1987).

identification of the difficulties and failures of government.' (Rose and Miller, 1992 p.181-83) Ecological governmentality is a problematising political rationality, which continuously seeks to improve the techniques for managing the environment and those social activities that impact upon ecological processes. Ecological governmentality therefore continually problematises the social relation to nature at a basic ontological (and moral) level. In many respects, ecological thought articulates the fundamental philosophical dilemma of the *dialectic of enlightenment*, in which modernity, with its dependence on instrumental, scientific knowledge, embodies a self-destructive social relation to nature. However, as Klaus Eder (1996) has argued, differing and sometimes even incommensurable validity claims mean that the conflict over the social relation to nature cannot be resolved by reference to the 'implicit validity claims' of critical theory.

It is however possible to develop a historically grounded theoretical framework for the analysis of these sort of ecological discourses, conflicts and practices by drawing on the work of Foucault, recent governmentality studies, and Latour and actor network theory. Such an approach, while cognisant of the macro-sociological dimensions of biopolitics, is also able to relate this to specific, localised governmental programs and technologies involved in governing the social relation to nature. The work of Rose and Miller in particular draws on Latour and Callon. In doing so it emphasises that programs of government emerge as a means of establishing 'translatability between the moralities, epistemologies and idioms of political power, and the government of a specific problem space, (which) establishes a mutuality between what is desirable and what can be made possible through the calculated activities of political forces.' (Rose and Miller, 1992 p.178-82)

An important research agenda for scholars who seek to understand the relations of power and knowledge in contemporary ecological discourse is the application of the insights derived from governmentality and actor network studies to an environmental 'history of the present'. Such research would involve the meticulous, empirical study of the three dimensions of governmental rationalities, and the ways in which these are shaped by the dynamic interactions of scientific knowledge and expertise, material technologies, ecological movements, state-based regulatory regimes, and the influence of global forces of marketisation.

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