Chapter 11

Nature and Culture: On the Career of a False Problem

Bruce Braun

This essay tracks the career of a problem that has long occupied cultural geography: the *relation* between culture and nature. To speak of a problem in terms of its career is to call attention to its historicity. However, I am less interested in providing a progressive disciplinary history concerning attempts to understand the 'relation' between nature and culture, than in exploring how this problem has come to be defined, taken up, and debated within a shifting configuration of ideas, institutions and practices. Thus, while this chapter explores the changing fortunes of the 'nature–culture' problem within cultural geography (and the currency of various theoretical and empirical approaches that cultural geographers have used to understand it), it also suggests a way of reading disciplinary knowledges, not as the progressive unfolding of truth, but as truth-claims that carry within them multiple and diffuse genealogies. Such an approach may enable us to see the *problem* of the relation between nature and culture as itself historical – perhaps even what Deleuze (1991) defined as a 'false' problem – and thus to imagine – much as Foucault (1970) imagined for the figure of 'man' – the moment when it passes from the stage of history.[1]

To simplify this task I will divide the career of the nature–culture problematic in post-1950s Anglo-American geography into four 'moments': cultural ecology, political ecology, cultural studies of the environment, and actor-network theory (or 'nonmodern' ontologies).[2] These are somewhat arbitrary distinctions: there are, after all, many points of continuity between them, and many scholars would imagine their work fitting well within several designations. Also, although I present these 'moments' in succession, it would be a mistake to assume that one follows the next like links in a chain. That is not how knowledges change. We will see, for instance, that work informed by actor-network theory in the late 1990s has a certain (uncanny) resemblance to the work of cultural ecologists from the 1960s, even as it rejects much of what traveled under the banner of political ecology or cultural studies of the environment in the intervening years. We will also see that each 'moment' is conjunctural – emerging at the intersections of many different intellectual and political projects. To take only one example, although cultural studies of

the environment can be read in terms of its *departures* from political ecology, very few of its practitioners have taken political ecology as their reference point, looking instead to fields as diverse as literature, philosophy, and cultural studies, in order to develop novel approaches to the study of nature and society. The temporality of this 'problem,' then, is neither linear nor singular. The distinctions I draw are meant to function heuristically, with the objective of calling attention to varied ways that the relation between culture and nature has been understood in the discipline since the 1950s, and with the goal of identifying what is at stake in the differences.

This chapter is more than a summary, however. I deploy the notion of 'moments' deliberately. This allows me not only to posit a changing career for this problem, but to posit its future passing. I will develop this argument later, although its outline can be briefly sketched here. The first three moments, I will suggest, did far more than investigate a problem located 'in' the world; they worked, each in their own way, to constitute 'nature' and 'culture' as separate domains, and to imagine the relation between them *as* a problem. In this sense, each of these moments is *performative* – they bring into being the very problem they seek to resolve. The fourth moment, I argue, is different from the others, since it produces a crisis within the problem itself. Its difference is not that it lies outside history, culture and politics (and thus in a different relation to the real); rather, unlike the other moments, it does not seek to find an answer to the question – "what is the *relation* between nature and culture?" – but instead sets out to displace this question and its founding categories altogether.

Read from the perspective of this last moment, the first three moments can be seen to follow – and reinforce – the terms of what Bruno Latour (1993) has called the "modern Constitution," which, among its various clauses includes the *separation* of nature and culture into distinct ontological domains. Viewed in this way it also becomes possible to see that in respect to its concern over the relation between nature and culture, the discipline of geography is symptomatic of a 'modern' episteme in which certain problematics presented themselves as self-evident, and in urgent need of investigation. To say this in somewhat different terms, as the discipline most concerned with the 'nature–culture' problem, geography filled a slot provided for it by the very terms of the modern Constitution. Indeed, we might press this further to suggest that in this respect geography is, paradigmatically, the *most* modern of disciplines, for unlike other disciplines, like sociology and political science, which have sought to explain the dynamics of the 'cultural' side of this dualism (through the analysis of 'culture,' 'society,' 'politics,' 'economy'), or, like physics and ecology, which have sought to explain the 'natural' side of this dualism (through the analysis of 'force,' 'energy,' and 'matter'), geography has made *both sides* of this dualism its object of investigation, not by placing them within the same analytical field, *but by continuously worrying over their relation*! In this sense geography must be read not only as an effect or symptom of this Constitution, but also a key source for its continued institutional and imaginative hold.

As we will see, the fourth moment that I track in this essay – nonmodern ontologies – does much more than displace the problem of culture and nature by attacking the terms of the modern Constitution, it also produces a crisis within the very notion of *disciplinarity*, and raises serious questions for how we understand 'cultural' geography or, indeed, the discipline of geography itself.

Culture and Nature: Tracking the Career of a Problematic

How are 'culture' and 'nature' related? What governs this relation? These questions have concerned geographers since the inception of the discipline in the nineteenth century. My goal here will not be to develop an exhaustive account of the different ways that these questions have been answered, reaching back to the time of figures such as Humboldt, Marsh, and Ratzel, but instead to map a distribution of competing contemporary approaches. For the sake of brevity, my descriptions will be necessarily coarse; a more careful examination of each position would locate many nuances that are not addressed here, as well as ways in which the positions bleed into each other. All three approaches that I initially examine – cultural ecology, political ecology, cultural studies of the environment – have developed highly influential accounts of the relation between culture and nature (or 'society–environment relations'), and have provided analytical tools that have been of great importance to geographers and scholars working in related disciplines.

Dreams of unity: cultural ecology and the seductions of systems theory

Cultural ecology – sometimes called human ecology – represents one of the most fascinating efforts in the history of geography to systematically investigate the relation between nature and culture. It gained prominence in geography in the late 1960s and early 1970s, leaning heavily on the work of ecological anthropologists for its intellectual resources and methods. Although its influence has waned, it continues to cast a long shadow over the discipline, and still claims many adherents (see Turner 1989, Butzer 1989).

Stated in broad terms, cultural ecology sought to develop a *unified theory* of culture and nature, one which would dissolve the culture–nature dualism and replace it with a single totality. To achieve this it drew extensively on the science of *ecology*, the field of *cybernetics*, and *systems theory* more generally. At the very outset, this tells us something about the traffic in ideas between disciplines – how ideas developed in certain contexts come to be *translated* into other contexts and with what effects. At the time, ecology, systems theory and cybernetics were immensely popular resources not only for geographers, but for scholars across the social sciences, much as political economy, poststructuralism, and cultural studies would be in the 1980s and 1990s.[3] From these resources cultural ecology developed one of its central and most controversial claims: that human activities, much like the activities of other organisms, played *functional roles* within ecological systems, roles which contributed to the integrity and continuity of these systems. This central concept provided the basis for a research agenda that saw scholars fan out across the globe to investigate the ecological function of specific cultural practices (such as methods of cultivation, property ownership, or rituals), and to attempt to understand these practices in terms of *adaptation to* and *regulation of* specific environmental conditions. The resulting studies provided a wealth of fine-grained empirical studies that enumerated the cultural practices of various 'traditional' societies, gathered data on climate and ecology, evaluated cultural practices in terms of flows of energy and matter (measured in units such as calories), and mapped the complex feedback loops that connected cultural practices and local ecologies.

These efforts were fraught with both logical and logistical difficulties, but before turning to these I wish to suggest that the objectives of cultural ecology were more interesting than many of its critics have allowed. In important respects cultural ecology was a reaction to developments in anthropology (and elsewhere in the social sciences) which had resulted in 'culture' (or 'society') being understood to develop according to its own internal dynamics, entirely *autonomous* from its physical environments. As Marvin Harris (1974) complained, anthropology had increasingly accepted the position that culture begot culture, and thus had lost its ability to understand the *material conditions* within which cultural practices emerged and to which they adapted (in anthropology Harris's position came to be known as 'cultural materialism'). The culturalism of mid-century anthropology, of course, was quite understandable, having developed in reaction to the earlier influence of environmental determinism (or anthropogeography – the belief that the environment determined the traits of individuals and societies) and in response to possibilism (the belief that nature set certain parameters within which humans exercised choice or will). Geographers and anthropologists had rightly identified both as harboring dubious, even racist, conclusions. Indeed, it should be noted that many cultural ecologists were as wary of these positions as their so-called culturalist colleagues. Or, more precisely, while they accepted the *interrelationship* of culture and nature posited by environmental determinism and possibilism, they rejected what Clifford Geertz (1963) called their 'holism' (see also Vayda & Rappaport 1968). This was essentially an argument about scale and level of abstraction. As Geertz explained, these earlier approaches had understood both culture and ecology in such *broad* terms as to be virtually meaningless: 'Eskimos' and 'Aborigines,' understood in terms of 'polar regions' and 'deserts.' The conclusions drawn at this level of abstraction, he argued, could not possibly be substantiated. Yet, for ecological anthropologists, the *rejection* of environmental determinism and possibilism was seen as equally problematic, since it had led scholars to privilege historical or cultural influences as the sole determinants of cultural phenomena, thereby severing any connection with the environment (Vayda & Rappaport 1968) or material conditions (Harris 1974).[4]

As we will see later, these arguments anticipate many of the criticisms put forward by actor-network theorists, who some three decades later would argue that Western societies had lost their ability to recognize the ways that people and things were intimately connected. Bruno Latour (1993), for instance, has argued that our failure to locate people and things on the same ontological and analytical plane is the reason we 'shuttle' between two opposed positions – that people are all-powerful and can transform their culture in whatever way they pleased (culture begets culture), or that people are impotent and can do nothing, since culture is determined by nature (environmental determinism). In a sense cultural ecologists sought to resolve this contradiction by seeking a middle ground that avoided the excesses of environmental determinism, but that also rejected the idea of the autonomy of 'culture.' This would be accomplished, some of its practitioners thought, by developing more thorough, fine-grained understandings of the *specific relations* that existed between local communities and their surrounding environments.

This put great emphasis on fieldwork, as individuals and research teams enumerated, measured, and diagrammed the "complex, systemic interrelationships"

(Butzer 1989) that bound peoples and ecologies in particular places. These efforts were initially led by a number of ecological anthropologists, including prominent figures such as Julian Steward, Andrew Vayda, Roy Rappaport, Marvin Harris, and Clifford Geertz. Steward (1955) outlined some of cultural ecology's first methodological principles, including that the researcher must first isolate those aspects of cultural practice whose functional ties to the environment were most explicit, or where the interdependencies of cultural practices and organism–environment relationships were seen to be most crucial. Not insignificantly, Steward called these practices the 'cultural core,' in contrast to other cultural practices which he considered contingent or secondary. In turn, the cultural ecologist would isolate the ecological relations and processes that appeared most important for the human 'adaptations' that had been identified. Geertz (1963: 8) considered this a relatively straightforward task:

> If one empirically determines the constellation of cultural features which are most unequivocally related to the processes of energy interchange between man and his surroundings in any given instance, one necessarily also determines which environmental features have primary relevance for those same processes.

Beginning with a cultural practice, researchers would carefully detail its ecological consequences – modifications of soils, vegetation and animal life, number of calories produced as food – and outline the various relations and feedback loops in the system, thereby revealing how existing practices had 'adapted' to environmental conditions. Significantly, neither Steward nor Geertz sought to collapse *all* cultural practices and *all* ecological processes into a single system. Geertz, in particular, argued that some practices were completely unrelated to environmental conditions, and rejected Steward's designation of 'core' and 'contingent.'

These limited qualifications would appear to go some way to rescuing cultural ecology from accusations that it merely packaged an updated environmental determinism. But others were far less cautious and sought to extend the emerging discipline further in the direction of finding 'adaptation' as the key to culture. Andrew Vayda and Roy Rappaport (1968), for instance, argued that Steward had a far too limited view of *which* cultural practices had ecological significance, and thus which practices could properly be seen as adaptive responses to environmental conditions. In particular, they chastised Steward for disregarding religious practices, especially rituals. Within anthropology at the time it was common to explain (or dismiss) these as functioning merely to mediate the fear and powerlessness of primitive peoples in the face of natural forces – a cultural response to the terror of sublime nature. Of those studies that sought to understand such 'secondary' practices in terms of ecological functions, Roy Rappaport's (1967) infamous study of the ritual of pig killing in New Guinea is perhaps most widely cited. In his study Rappaport argued that pig-killing rituals had important *ecological* functions. His conclusions are worth quoting at length:

> The Tsembaga ritual cycle has been regarded as a complex *homeostatic* mechanism, operating to maintain the values of a number of variables within 'goal ranges' (ranges of values that permit the perpetuation of a system, as constituted, through indefinite periods of time). It has been argued that the regulatory functions of ritual among the Tsembaga and Maring

> help to maintain an undegraded environment, limits fighting to frequences that do not endanger the existence of the regional population, adjusts man-land ratios, facilitates trade, distributes local surpluses of pig in the form of pork throughout the regional population, and assures people of high-quality protein when they most need it. . . . The Tsembaga, designated a 'local population,' have been regarded as a population in the animal ecologist's sense: a unit composed of an aggregate or organisms having in common certain distinctive means whereby they maintain a set of trophic relations with other living and nonliving components of the biotic community [with?] which they exist together. (p. 224)

Similar conclusions about 'ritual' were reached by other researchers, from shoulder-blade divination among North American caribou hunters (Moore 1957), to sexual license during the ceremonial season among the Indians of the Central Desert of Baja California (Aschmann 1959). Such studies came perilously close to reproducing the environmental determinism of anthropogeography, and the possibilism of the French geographer Vidal de la Blache.

In geography, cultural ecology would gain importance in the 1970s, led by figures such as Bernard Nietschmann, Karl Butzer, William Denevan, Alfred Siemens, and Philip Porter. These studies would for the most part follow the theoretical and methodological innovations of ecological anthropology. Nietschmann's research on the Miskito Indians on the Caribbean coast of Central America is in many ways typical. Following the lead of Steward and others, Nietschmann (1973: x, 1) sought to determine "how a particular population had adapted to local ecosystems and modified them," beginning with the assumption that "many indigenous cultures which interact with these [Latin American] ecosystems have adapted their food resource strategies so that ecological integrity is protected." To be sure, this was not a unidirectional imprinting of nature on culture; rather, through recourse to systems theory, the environment and human populations were understood as "parts of an interacting system which, through its circular relationships and systems of negative and positive feedback, influences and modifies each one and changes them together" (p. 4). Similar to the ecological anthropologists, for Nietschmann 'ecosystem' became the master term, borrowed directly from Eugene Odum's 1959 classic, *Fundamentals of Ecology*.

These studies would later come under harsh criticism, but it is not hard to see why it should have been viewed with such promise, or why the work of cultural ecologists has received renewed, albeit critical, attention in recent years. The payoff, Geertz (1963: 8) argued, was that

> the sharpness of the division between analysis from the side of 'man' and analyses from the side of 'nature' . . . disappears, for the two approaches are essentially alternative and interchangeable conceptualizations of the same systemic process.

Cultural ecologists, Geertz explained, could achieve an "exact specification" of the "relation between selected human activities, biological transactions, and physical processes" (p. 2), and could do so by "including them within a single analytical system, an ecosystem." In short, Geertz imagined that it was possible to understand cultures and their environments as *single* entities, anticipating in a somewhat uncanny manner similar calls made across the social and ecological sciences several decades later. Indeed, read from the perspective of the nonmodern ontologies that

I will discuss below, Geertz's critique of existing approaches to the 'culture and nature problematic' is worth quoting at length. Speaking of anthropogeography and possibilism, he wrote:

> Both initially separate the works of man and the processes of nature into different spheres – 'culture' and 'environment' – and then attempt subsequently to see how as independent wholes these externally related spheres affect one another. With such a formulation, one can ask only the grossest of questions: "how far is culture influenced by environment?" "How far is the environment modified by the activities of men?" And can give only the grossest of answers: "To a degree, but not completely." (p. 2)

Andrew Vayda put it similarly:

> Although there have been numerous pleas for treating cultural, environmental, and human biological variables as parts of one system, these pleas have been but little heeded by most social scientists. Even among the relatively few contemporary social scientists who are especially concerned with the relation between cultural and noncultural phenomena, the prevailing tendency has been to define the cultural variables and the other ones as belonging to separate systems and then to ask about the influence of the systems upon one another. (1967: xii–xiii)

Taking an 'ecological' approach, Geertz explained, would not separate the works of man from the processes of nature, but instead understand them as an *integrated whole*, since "material interdependencies" would "form a [single] community."

I will revisit these claims later. For my present purposes, what is of interest is less cultural ecology's call for a unified theory, than how this unity was conceived. As already noted, cultural ecology emerged during the heyday of ecosystem ecology, systems theory, and cybernetics. From ecology, cultural ecologists borrowed more than an increased awareness of biological processes and ecological relations, but also the notion of *interrelated wholes*, captured most fully in the notion of 'ecosystem.' From systems theory they took on board the notion of complex feedback loops, often appealing to the elegant diagrams of the ecologist Eugene Odum. And from cybernetics they found a new basis for an age-old belief in homeostatic systems and the balance of nature (see Demeritt 1994).

This potent combination may have promised to bridge the poles of nature and culture (Zimmerer 1996: 172), but it also provided the conceptual scaffolding for cultural ecology's most significant – and problematic – claim: that cultural practices had *functions* within larger ecological systems, and could be understood and analyzed in these terms (a claim that aligned cultural ecology with forms of Darwinism). Under the sway of systems theory, cultural practices were often taken to exist solely as *adaptive mechanisms* whose purpose was to retain *equilibrium* in the system as a whole. In his study of pig-killing rituals, for instance, Rappaport (1967: 4) made much of the 'self-regulating' nature of systemic relationships, drawing an analogy between cultural practices and thermostats. Each was seen to regulate the environment in a way that kept conditions relatively constant. Even Geertz, known later for his 'thick description' of cultural practices, drew inspiration from Odum

in order to argue that the "maintenance of system equilibrium or homeostasis is the central organizing force" of specific cultures and cultural practices.

Although far from uniformly applied, this reliance on general systems theory and its associated notions of balance and self-regulation would eventually come under withering attack. Foremost among the charges leveled at cultural ecologists was that of functionalism – that theories of 'cultural adaptation' falsely imputed the *effects* of cultural practices as their *cause*. As Zimmerer (1996) notes, this problem was exacerbated by the tendency of such studies to be synchronic and ahistorical. Few researchers made any effort to develop historical accounts of how specific cultural practices emerged, or how they came to be extended across space and time. As complex as were cultural ecology's charts of energy flows, and as finely grained as were its descriptions of the ecological role of cultural practices, it was never quite able to adequately answer the 'why' question of cultural practices. Neither the *genesis* of cultural practices nor their *transformation* could be explained, except through vague appeals to 'adaptation.'

Equally as problematic, while writers like Geertz imagined that these studies finally transcended the culture–nature dualism, showing culture and nature to exist as a *single* unit, they in large part did so through a sleight-of-hand – by collapsing culture *into* nature. To be sure, human actors did things – they plowed, told stories, performed rituals – but nature largely predetermined what these actions would be. Nature and culture were brought together, critics asserted, but at the price of losing half of the actors!

During the 1980s, challenges to cultural ecology's central concepts – adaptation, trophic systems, feedback loops, homeostasis – intensified. To charges of functionalism would be added the charge of historicism, since the field's assumption of homeostasis – again borrowed from systems theory and ecosystem ecology – conspired to make its accounts remarkably teleological. All cultural practices were seen to lead to the same inevitable end (ecosystem integrity). To be sure, not all cultural ecologists fell into these traps. Its more astute adherents carefully distinguished between approaches which claimed to *explain* cultural practices, and those which merely noted the ecological *function* that cultural practices appeared to have, without imputing cause (Vayda & Rappaport 1968). As Vayda (1967: x) put it in a spirited defense of cultural ecology, the object of analysis was "a demonstration of how things work rather than an explanation of why they exist or how they have come to be." Yet the line between description and explanation was often blurred and the notion of adaptation frequently smuggled in the very assumptions that Vayda fought to excise. Other cultural ecologists noted that not all cultural practices led to homeostasis: some produced catastrophic change. But more often than not these were seen as a result of the introduction or diffusion of new or foreign practices that upset the fine-tuned balance that had been achieved between local communities and their environments. That cultural ecologists almost universally studied 'traditional' societies no doubt contributed further to this sense of socio-ecological balance, tapping into widespread understandings of modernity as rupture and premodern societies as inherently ecological.

Other critics focused on how cultural ecologists conceived of 'culture,' faulting practitioners for presenting culture as monolithic, static and bounded, and for erasing history and politics (see Duncan 1980; Cosgrove & Jackson 1987; Gupta

& Ferguson 1997). Indeed, for many critics, the language of ecology was partly to blame. In the texts of some cultural ecologists culture had itself come to be understood like an organism – and as an organism, a functional part of an ecosystem – rather than as an outcome of political contestation, as cultural anthropologists and the 'new' cultural geographers claimed it to be, or as bound up with social and economic forces, as political economists increasingly argued it was. As a result, critics suggested, *relations of power* were ignored entirely, except in the broad historical frame of culture groups being 'displaced' by others (cf. Peet & Watts 1996).

Beginning in the late 1970s, competing approaches emerged in geography that contrasted with, and often directly contested, the functionalism and teleology of cultural ecology, and which sought to understand the decisions of individual actors – what Blaikie and Brookfield (1987) would famously call 'land managers' – in terms of the *social relations* within which they lived. This marked a significant departure, for it immediately called into question cultural ecology's depoliticizing language of 'adaptation' (which reduced culture to nature), and its tendency to locate agency in abstract entities like 'cultures' and 'ecosystems.' Instead, the turn to social relations focused attention on the social, ecological, and political contexts – at local, regional, and global scales – within which individual actors lived, and sought to investigate how *these* relations shaped environmental practices.

Political ecology and the turn to the social

We have now moved some distance toward our second 'moment,' political ecology. How did political ecology reconfigure how geographers approached the problem of the *relation* between culture and nature? In brief: by turning to the social. We will see shortly that this turn remained fully within the terms of Latour's 'modern Constitution,' despite its promise to do otherwise and despite its recourse to dialectics as a way of overcoming modern dualisms.

In geography, political ecology took root in the 1980s, but its sources are far too diffuse to allow it to be read solely as a reaction to the pitfalls of cultural ecology. Indeed the notion that political ecology merely 'advanced' or 'transcended' cultural ecology is belied by two observations: first, although its popularity has diminished, cultural ecology is far from dead, and continues to have influence in the discipline (see Butzer 1989; Turner 1989; Sluyter 1996, 1999), and, second, even during the heyday of cultural ecology in the 1970s, other scholars were approaching questions of culture and nature through terms that were similar to what would travel under the banner of political ecology in the 1980s and 1990s. The earliest uses of the phrase political ecology, for instance, date to the early 1970s and the work of the anthropologist Eric Wolf (1972), writer Hans Magnus Enzensberger (1974) and journalist Alexander Cockburn (Cockburn & Ridgeway 1979),whose writings made explicit a set of political questions around natural resources and the environment, including rights of access and control (see Watts 2001, Zimmerer 1996).

A complete genealogy of political ecology is beyond the scope of this essay, but a number of important threads can be identified. The 1970s were a decade of increased concern over environmental conditions, both in the developed economies of the West and in less developed regions in Asia, Africa, and Latin America. One influential response was neo-Malthusian, which placed the blame for environmental

degradation on population growth, and thus firmly at the feet of those most affected by environmental change in the Third World (see Ehrlich 1968). Critics of neo-Malthusian ideas argued that it was not population growth, but poverty and its structural causes that were to blame. With this came far greater emphasis on structural relations, and increased attention to the affects of political and economic change (especially the transition from subsistence to market economies) as well as the role of economic and political actors such as the state, corporations and nongovernmental organizations. The 1980s also saw the resurgence of political economy – and social theory more generally – across the social sciences and humanities. This provided geographers with a very different toolkit through which to interrogate questions of 'culture' and 'nature' (now frequently discussed as 'society' and 'environment'). In place of cybernetics and general systems theory, researchers turned to Marxist political economy, structuration theory, Weberian sociology, and world systems theory, in order to understand the economic logics and social relations that shaped the decisions of environmental actors. Political ecology found an additional source in studies of 'natural hazards,' a field which was going through a similar transition, moving from seeing such hazards as floods, drought, and famine as caused entirely by nonhuman forces, to investigating their social, political, and economic causes and their radically uneven social effects (Sen 1981; Watts 1983; Smith & O'Keefe 1980; Hewitt 1983; Susman, O'Keefe, & Wisner 1983). As attention shifted to the social causes of environmental change, skepticism increased over the organic analogies, Darwinian terminologies, and systems theories that prevailed in cultural ecology. Increasingly, cultural ecology came to be viewed as apolitical and asocial, even if, like Bernard Neitschmann, its practitioners were deeply concerned with the peoples and environments they studied.

Today, what travels under the name 'political ecology' is remarkably diverse. This is in part because there is no single theoretical 'core' that anchors it, in contrast to the more unified project of cultural ecology. Nevertheless, for my purposes 'political ecology' usefully designates a number of key shifts that occurred in how the relation between culture and nature was conceptualized during the 1980s. Perhaps the most important was the transition – already noted – from a focus on culture and adaptation, to a focus on the actions of individual actors and their enabling and constraining social conditions. This approach demanded attention to *scale*, a point raised early by Eric Wolf (1972), and taken up more extensively by political ecologists in the years following. Exemplary in this regard was the work of Piers Blaikie (1985), whose study of soil degradation in South Asia focused on the resource manager (usually a peasant) and sought to understand the wider economic and political forces shaping their land-management decisions. A later edited collection with Harold Brookfield (Blaikie & Brookfield 1987) extended these insights in order to tackle the Malthusian assumptions prevalent during the period head-on, with its editors and contributors arguing that there was a causal – and cumulative – relation between poverty and environmental degradation. Conditions of poverty, they argued, led to poor environmental management strategies, often out of necessity. This in turn led to environmental degradation, which could exacerbate the poverty of the land manager. For Blaikie and Brookfield, the poverty of the land manager could not simply be blamed on overpopulation, but instead had to be understood through 'chains of explanation' which linked local decisions with wider

social, economic and political structures (property rights, state power, market relations, ideas and ideologies).[5]

While the work of Blaikie and Brookfield was exemplary, it was far from unique. Increasingly, others working at diverse 'Third World' sites – Michael Watts, Suzanna Hecht, and Alex Cockburn, for instance – brought political economy to bear on environmental problems. Over time what constituted the 'social' factors linked to environmental change (through their impact on access and control over resources) would expand to include not only market capitalism, the state and property, but also international or multilateral organizations such as the World Bank and the IMF, the actions and strategies of transnational corporations, the practices of myriad non-governmental organizations (both local and international), and the tactics of local communities and individuals (for a survey, see Bryant & Bailey 1997). Likewise, analysis in terms of class difference was increasingly widened to include the connections between political struggles over resources and environment and questions of ethnicity (Watts 1998), gender (Rocheleau et al. 1996; Schroeder 1999) and nation. Richard Schroeder's *Shady Practices* (1999), a study of gender, nature, and politics in Gambia, exemplified this broadened political ecology. In this work he tracked the relation between gender politics and struggles over land tenure, while at the same time linking these struggles to the intersection of economic change, drought and famine, and placing these struggles – and their outcomes – in the context of shifting funding agendas and development paradigms of NGOs, large donor agencies, and organizations such as the World Bank. In one of the book's most innovative elements, Schroeder analyzed the changing terms of a *discourse* that linked 'women' and 'development,' and explored how this discourse was taken up within development programs and influenced the types of projects funded by international agencies during the 1980s and 1990s. By so doing Schroeder not only made important connections with the work of feminist critics of development (see Shiva 1988, Agarwal 1992, Jackson 1993), he also drew attention to the significance and politics of *language* and the role of struggles over *meaning*, for how 'development' and 'environmental change' proceeded in particular sites. This was evident within development agencies and state institutions, but also within the local communities affected by development and environmental change, in which individual actors struggled with and over 'words' at the same time as they struggled over land and access to resources. As we will see shortly, this attention to language and meaning would become increasingly important not only in political ecology, but more broadly in the study of the 'culture of nature' as the 1990s progressed.

Taken together, these diverse strands of political ecology represented a significant change in the terms that were now seen to govern the 'relation' between culture and nature. Where cultural ecology had imagined individual bounded culture groups adapting to environmental conditions, political ecologists sought to understand the environmental and resource-use practices of peasants in much wider political-economic, institutional, and discursive contexts. Where the scale of analysis of the former was decidedly – and usually unquestionedly – 'local,' questions of scale themselves became key for political ecologists, who insisted that 'local' events and practices be understood in terms of actors and institutions that operated at regional, national and international scales. This was not simply a matter of locating the correct scale of analysis, but of recognizing that scale was *relational* – that the 'local'

was constituted in relation to events and actors at other scales, and vice versa. Further, whereas in cultural ecology, culture was seen as singular and monolithic – "a culture" – political ecologists placed increasing emphasis on politics and power, and moved the 'environment' from a neutral object that provided a template for culture, to a 'politicized' domain that was the object of intense political struggle. Finally, whereas for cultural ecologists nature and culture were understood to exist in a unity as a result of complex interactions and feedback loops that led to homeostasis (the thermostat metaphor), in political ecology, nature and culture were understood in a unity that was decidedly *dialectical* rather than *homeostatic*. Here the concerns of political ecologists intersected with those of historical materialists who understood human actions as part of nature's 'metabolism': people were understood as one of nature's constituent parts, but also as a *productive force* that continuously transformed nature and was transformed in the process (see Schmidt 1971, Smith 1984, Castree 1995). In this sense, nature was not something external to which people had to adapt – it was thoroughly 'social,' its future form to be determined by history and politics (Smith 1984, Braun & Castree 1998).

This final distinction is important. If cultural ecology resolved the culture/nature dualism through collapsing culture into nature (accomplished through the generalization of the metaphor of 'ecosystem'), political ecology sought to resolve the dualism through a double move. Like cultural ecology it asserted a unity, but unlike cultural ecology, the arrow of determination was reversed: people were still considered a constituent part of nature, but the agency of nature was now replaced with an emphasis on *humans* as productive and transformative agents. Further, in contrast to cultural ecology, political ecology made no attempt to provide a single epistemology. Karl Zimmerer (1996) astutely notes that while cultural ecology imagined that it could study nature and culture as a single entity and through a single method (measuring flows of energy and matter), political ecology *divided* the study of ecology (and the ecological impacts of human actions) from the study of society and its structures, each of which was assumed to have its own 'autonomous' existence and laws or imperatives. To the physical sciences it gave nature and natural processes; to the social sciences it gave politics and social relations. This was encapsulated in the turn to dialectics, which understood 'nature' and 'society' in terms of a progressive *interaction* between different elements – a "constantly shifting dialectic between society and land-based resources, and also within classes and groups within society itself" (Blaikie & Brookfield 1987).

While political ecology's turn to the social appeared to resolve the problem of history and politics – that which cultural ecology lacked – it brought back history and politics at a price. On the one hand, it accepted without question the terms of the modern Constitution. It began by dividing the world into two separate domains – nature and society – and then sought to understand their relation. Dialectics provided a way of imagining this process, but while dialectics allowed for the 'interaction' of the two domains, it merely made the divide more permeable (Castree 2002). Worse, as critics quickly noted, political ecology granted agency, history, and politics to only one side of this dualism – 'society' – which was now conceptualized as a realm of struggle and contestation, the outcomes of which would be *imprinted* on the environment. To be sure, the old notion of 'feedbacks' was occasionally retained, such that human transformations of nature were seen to have subsequent effects,

but for the most part the second domain – 'nature' – was merely imagined as a static entity – the 'ground' over which politics occurred, but most certainly not a dynamic actor in its own right. Ironically, and perhaps unwittingly, in its reaction to the depoliticizing language of cultural ecology, political ecology merely reversed its position, and thus reinstalled the very same dichotomy. Whereas cultural ecology collapsed culture into nature, political ecology did the opposite, turning the arrow of causation around but keeping the dualism in place.

This apparent erasure of nature's 'agency' would become an issue of considerable anxiety in the late 1990s (see below). But, significantly, this was *not* the source of the first criticisms of political ecology. Far from expressing concern that political ecology had lost sight of ecology, critics of political ecology focused on a different matter: that in their scramble to locate the *wider structures* that shaped human practices, political ecologists had managed to get the 'social' side of the equation wrong.

The cultural studies of the environment: challenging essentialisms, deepening dichotomies?

What had been political ecology's error? In the minds of its critics, it had fallen into two traps. On the one hand, its turn to social *structures* left it open to the accusation of replacing environmental determinism with social determinism. If, for cultural ecologists, individuals and communities were merely bearers of 'culture,' and culture was itself an adaptation to environmental conditions, then under political ecology, individuals and communities fared no better, for their actions were now determined by economic logics, state rationalities, and ideologies both beyond their control and beyond everyday consciousness. Indeed, it is notable that despite its claim to study a 'politicized environment,' political ecology often had as little to say about politics as had cultural ecology, for while cultural ecology had overemphasized the role of 'culture' as an overarching and unified set of beliefs and practices, political ecologists often did the same for the 'economy,' the 'state,' 'modernity,' and 'ideology,' such that the way that local communities and individuals negotiated, resisted, or helped constitute specific economic and political processes was vastly under theorized. Political ecology had a great deal to say about 'large' structures, but far less to say about how local actors came to passively accept the roles that these larger forces apparently had in store for them. In response to these problems, questions of resistance, and the ways that local communities and individuals appropriated or contested state projects, market relations, or even the plans of NGOs, increasingly found their way into the work of a second generation of political ecologists who were much more attuned to 'micropolitics' and to the performative aspects of cultural, political and spatial practices (Moore 1998, Moore 2000, Escobar 1996, Schroeder 1999).

A second charge – economism – was related to the first, but was directed specifically at the privileging of *political economy* in accounts of struggles over resources and environment. Here the concern was that too much emphasis was placed on economic forces, with many early accounts relying on a base–superstructure model that tended to see all other dimensions of social life as secondary, or as determined by the economic. Second-generation political ecologists would respond to this too,

integrating into their analysis much greater attention to the cultural practices, scientific knowledges, and discursive relations that were equally important constitutive elements in political struggles over the environment and development. To conceptualize this, many turned to the work of the Italian Marxist, Antonio Gramsci, and the French historian and philosopher, Michel Foucault (see Moore 1998, Escobar 1996). From Gramsci was borrowed the notion that the rule of governing classes was enabled not only through force, but through the consent of the subaltern classes, brought about through the church, schools, and cultural institutions. This challenged the narrow economism of Marxist political economy, and rejected deterministic arguments about social structures. In a move that echoed Vayda and Rappaport's call to cultural ecologists to widen their scope beyond those cultural practices most obviously linked to the environment, political ecologists that followed Gramsci's lead took a much wider view of the *sites* at which struggles over access and control over resources occurred, no longer content to study state institutions and market reforms, but also schools, religion, historical narratives, and science.

Others turned to Foucault, whose reworking of conceptions of power, investigation of the relation between power and knowledge, and careful attention to processes of subjectification, proved immensely productive for rethinking how political ecologists conceived of 'social relations' and 'politics.' For Foucault, power was not something possessed by sovereign entities (institutions, individuals, dominant classes or the state) as if it were a thing, but rather was *immanent* to the world, present in, and working through, orders of knowledge, the organization of space, and the training of bodies. It was at once relational and capillary, diffused and everywhere, best understood as a 'field' or 'grid' of knowledges, practices, and spaces within which people and things were made visible and available to administrative or disciplinary mechanisms. In this sense power was *positive* or *productive* rather than *repressive*: it constituted subjects and enabled actions, including actions that undermined particular social orders. Often combined with Gramscian critiques of 'hegemony,' the influence of Foucault could be found in notions such as 'countermapping' (Peluso 1995), or in the 'micropractices' studied by Donald Moore (1998), who understood cultural practices around conservation in Zimbabwe as key sites of struggle over the fate of landscapes and communities.

Foucault's influence was also evident in the turn to the study of *environmental discourses* – those bodies of ideas, concepts and knowledges through which actors understand and engage with their ecological surrounds (see Darier 1999; Luke 1997). Studies of environmental discourse relied heavily on an interpretation of Foucault that took understandings of the world to be *effects of power*, and which simultaneously understood power to operate *in and through* forms of knowledge that infused everyday life. Often this was combined with other strains of post-structuralist thought (semiotics, deconstruction) which emphasized the arbitrary and unstable nature of 'reference,' and which understood the *legibility* of the world to be an effect of signification rather than something discovered and reflected in nature (see below). In short, poststructuralisms of various sorts were taken to have displaced the image of language (or thought) as the 'mirror of nature' (Rorty 1980) and replaced it with a notion of language as constitutive of what *counts* as nature. Over the past decade these arguments have been taken up by a number of scholars

working on questions of nature, politics, and environment. Within political ecology, for instance, Arturo Escobar (1996), argued that representations were social facts – that language did not 'reflect' nature, it 'constituted' what counted as nature – and deployed this insight to interrogate the discourse of 'sustainable development' as it was employed in Columbia. This discourse, in which "nature is resignified as environment," Escobar argued, was thoroughly infused with relations of power. It was at once consistent with the emergence of a scientific gaze which Foucault had previously claimed "enabl[ed] one *to see* and *to say*" (quoted in Escobar 1996), and also crucial for the sustainability of capital today through intensive forms of environmental *management*, what Escobar called a new 'postmodern' form of capitalizing nature. For Escobar, the significance of interrogating discourses such as "sustainable development" lay in making visible the power relations that operated in its terms, attending to the relation between knowledge and administration (or *governmentality* – see Darier 1999; Luke 1997; Braun 2000), and calling attention to the increased significance of 'expert' knowledges at the expense of other knowledges, which came to be displaced or subjugated.

While poststructuralist theory had considerable influence on political ecology in the 1990s, its impact extended far beyond political ecology, and increasingly gave rise to novel approaches to the study of culture and nature. I will refer to this third 'moment' as the *cultural studies of the environment*. Again, a sharp distinction between more poststructuralist approaches to political ecology and cultural studies of the environment is somewhat arbitrary. Some, like the anthropologists Donald Moore and Arturo Escobar, fit well in both. However, to the extent that certain common themes can be identified, such a distinction may be warranted. These themes included the following: the study of 'nature' as a cultural construction; close attention to the relation between power and knowledge in struggles over resources and environment; greater emphasis on representational practices – science, art, literature – as sites where nature was called forth as an object of knowledge and contemplation; and an awareness that constructions of nature were never innocent, but instead intricately entangled with, and enabling of, governmental rationalities, racial and colonial discourses, and the construction of gendered, racial and ethnic/national identities.

If, like political ecology, cultural studies of the environment can be said to have a theoretical 'toolkit,' the tools of the latter are considerably different than those of the former, to such an extent that many scholars working in this area do not claim any direct affiliation with, or descent from, cultural or political ecology (see Sluyter 1997; Braun 1997b). Indeed, most have come to investigate the cultural politics of nature from other research agendas and very different theoretical and political concerns – studies of race and ethnicity, feminist and queer theory, explorations of colonialism and its technologies of rule, eco-politics and governmentality, critical race theory and post-Marxism. A complete genealogy would be daunting, but would most certainly take in semiotics (Barthes), the study of power/knowledge (Foucault), deconstruction (Derrida), poststructuralist feminisms (Haraway, Butler), and even, on occasion, psychoanalytic theory (Lacan), along with the cultural Marxisms of Gramsci and the English literary critic Raymond Williams.

This work is not limited to geography, and in many ways established itself elsewhere first. Alexander Wilson's (1992) immensely popular book, *The Culture of*

Nature, was one of the first to demonstrate the analytical power and political urgency of arguments that nature was 'culturally mediated' – known and understood through a vast array of images and ideas that circulated in film, literature, popular culture, advertisements and popular scientific narratives – and that this had consequences for the use and conservation of the environment. In a sense this updated and popularized the arguments of Raymond Williams (1980), who had earlier traced the changing fortunes of 'nature' within English literature and culture, drawing on Gramsci's notion of hegemony to link ideologies of nature with the power of ruling classes.[6] William Cronon's (1995) eloquent study of the concept of 'wilderness' also extended Williams' insight, revealing nature in the United States to be full of human history, both conceptually and materially. Like Wilson, Cronon's intervention was closely tied to an environmental politics, albeit one that conflicted with those American environmentalisms indebted to concepts and 'structures of feeling' bequeathed by Romanticism. His conclusion – that 'wilderness' took us to the wrong nature, since it presupposed a nature–culture dualism whereby that which was 'truly' natural was that which most fully excluded the human – vexed many. But it sought to raise awareness of how our tendency to dichotomize the world into these 'pure' domains made it tremendously difficult to develop an *ethical* and *political* relation to the world, since 'saving' nature – defined as the absence of the human – required eliminating people altogether, while spaces that could not easily be assigned to the category 'pristine' were inherently devalued (as 'modified' or 'degraded' landscapes) and not seen as worthy of ecological interest.

As noted above, others brought a decidedly semiotic approach, treating 'nature' as a signifier whose meaning was given by a system of signs. For the semiotician, 'nature' attained its meanings through the differential logic of a chain of signifiers rather than from the world itself. For structuralists like Ferdinand de Saussure, this differential logic of signification was both arbitrary, and in many respects, *fixed*. For poststructuralists, on the other hand, there was both nothing 'outside' language which could finally fix meaning once and for all and no necessary structure *to* language that governed meaning. Thus, it followed that the meaning(s) of 'nature' were always subject to the *play* of signification (Derrida 1976) and that how nature's meanings came to be provisionally established could be understood as a matter of both urgent scholarly investigation and ongoing political struggle (see Braun & Wainwright 2001).

Perhaps the most influential figure in this realm was the science studies scholar Donna Haraway (1992), who drew not only on semiotics, but was also influenced by Michel Foucault and his insistence that the world could be known only through the terms of specific (contested) discursive formations. Haraway drew a simple, but controversial, conclusion from her readings of poststructuralists: that what *counts* as nature could not exist separately from the practices through which it was rendered as a legible or knowable domain. Haraway's actual phrase – "nature cannot preexist its construction" – has been widely debated and often misunderstood. Some have suggested that this was an idealism of the worst sort, akin to claiming that the materiality of the world was merely 'in our heads.' Others claimed that arguments of this sort seriously damaged environmentalism, since it undermined the status of the very 'object' that environmentalists sought to save (see Soulé & Lease 1995).

The more common reading, and the one taken up by many cultural geographers, was actually far more consistent with the materialism that some thought Haraway was denying: that what counts as nature is necessarily the outcome of specific *practices* through which nature is given meaning. To say that nature was a 'trope,' not a thing, was therefore not a denial of materiality, it was an affirmation that language – and knowledge more generally – did not have an existence independent from the material practices by which statements about the world were produced. Here we might follow the geographer David Demeritt (1998), who has persuasively argued that Haraway should be read as advocating an 'artifactual constructivism' rather than a 'radical constructivism,' the difference being that while the latter takes the *world* to be our 'invention,' the former takes *knowledge* about the world to be a 'product' or 'artifact' (see also Latour 1987).

But it has been the connection between knowledge and power that has perhaps most defined the cultural studies of the environment. The phrase 'cultural' in this sense has largely referred to questions of representation (science, media, film), and struggles over, and debates concerning, the consequences of how 'nature,' 'organisms,' and the 'environment,' have been constituted as *objects of knowledge* and made *visible to power*. Often work in this vein has had explicit political intentions. Wolch and Emel (1998), for instance, have interrogated the way that 'animals' are set apart from 'humans,' a distinction which Kay Anderson (2001) has recently argued provides a basis for various racisms. Anderson (1998) has argued elsewhere that racialized knowledges have been produced not solely by the sciences of 'man,' but also, and perhaps more insidiously, by those sciences – like Linnaean botany – which take 'nature' as their primary object and field of investigation. Likewise, Jake Kosek (2002) has traced constructions of 'whiteness' and national identity in one of the most beloved icons in the United States: Smokey Bear. Indeed, the relation between constructions of nature and nationalism has become an important theme, from the Japanese context (Nakashima 1999) to German and Italian fascisms (Binde 1999) and English cultural nationalism (Bartram 1999). Likewise, the relation between nature and colonialism has recently seen considerable attention. In her work on ecopolitics and indigenous peoples in Australia, for instance, Jane Jacobs (1996) has explored the boundary stories that positioned aborigines in the domain of nature, and how these stories were produced, reinforced and contested in various Australian sites, including a proposed ecology center in Brisbane. Focusing on Western Canada, Bruce Braun (1997a, 2002) has traced the persistence of colonial relations in constructions of the 'temperate rainforest' by ecologists, foresters and environmentalists, and explored the significance of these images for recent political struggles over forestry and decolonization by First Nations. Derek Gregory (2001) in turn, has traced not only the workings of colonial power in how physical environments were described and known, but also how these representations invariably failed, with no little anxiety for colonial officials and agents for whom non-European natures were often sites of disorientation and terror (see also Taussig 1986). The argument in many of these texts – following on the work of postcolonial scholars such as Edward Said and Gayatri Spivak – is that constructions of nature (as *pristine*, *primeval*, *exotic*, *degraded*, or *unruly*) often provided justification for colonial projects which could then present themselves in the guise of civilizing missions, or as ordering a previously unmanageable landscape.

While many have applauded this cultural turn in studies of society and environment, it has also had its critics. Some have accused this work of trading in a 'discursive determinism,' merely replacing the structuralism of early political ecology with a new kind of determinism that views subjects, and their constitutive desires and knowledges, as effects of discourse rather than structures. Indeed, questions of agency have long been posed by critics of poststructuralisms, who have responded by pointing out that while they may have discarded the fixity of social, linguistic and economic structures, they have decidedly *not* done so in order to recuperate the sovereign subject of liberalism, with its sense of individual consciousness and agency. Other critics argue that the cultural studies of the environment has been little more than a diversion – that it gives its attention to 'texts' rather than 'material relations,' and to 'symbolic' rather than 'real' politics (see Harvey 1996). Such criticisms have been routinely dismissed as either misreadings of what is meant by 'textuality' (which is not just about 'texts,' but rather about how there is no transcendental location, no 'other' level, outside language and practice, from which to finally 'fix' meaning), or as complicit in a largely-discredited economism that dismisses cultural practices as merely 'superstructural.'

Far more serious objections have come from elsewhere, for if the 'cultural politics' of nature has become a prevalent theme in cultural geography in the past decade, so also has a countercurrent that has begun to question the ontological presuppositions that underwrite its claims, as well as those of cultural and political ecology. Informed by the philosophical writings of Gilles Deleuze and Félix Guattari, the work of sociologists of science Bruno Latour and Michel Calon, and the various interventions of Michel Serres, Isabelle Stengers and Manuel deLanda, among others, these critics have seized on the apparent *asymmetry* of many constructivist positions, in order to argue that by locating agency solely in the 'social' or 'cultural' domains, cultural studies is no longer able to say anything about what *nonhumans* contribute to the world, including to the social worlds of humans. To resolve this, some have suggested, it is necessary to abandon the 'nature–culture' problematic altogether, and substitute in its place a series of different concepts: hybrid networks, assemblages, abstract machines.

Beyond 'Culture' and 'Nature'? Nonmodern Ontologies

I will call this fourth moment 'nonmodern ontologies' for reasons that will soon become apparent. From this perspective the problem with political ecology and cultural studies of the environment is not that they propose nature as a social or cultural construction, and thus deny its autonomy, or that they reject language as a transparent medium for nature's representation. Rather, it is that their accounts presuppose a world divided into distinct ontological domains, and thus their accounts leave us with an impoverished understanding of the 'integrated networks' in which humans and nonhumans are entangled, in which entities (people, machines, words) continuously swap properties, and in which 'agency' is diffuse and relational, extending beyond humans to include all manner of other things. Each was guilty of accepting the terms of what Bruno Latour (1993) has called the 'modern Constitution.'

Latour coined the phrase 'modern Constitution' in order to call attention to the ontological presuppositions that underwrite modern society's self-understanding.

The word 'constitution' here has a double meaning. Much like a political constitution (i.e. the American Constitution), it refers to a set of governing principles and separations of power. It also functions as a foundational statement; that is, it calls a *political order* into being (or, in this case, a political ontology). This constitution is, quite literally, *constitutive* of our world, in the sense that it shapes how we understand the world, underwrites our actions, and informs the responsibilities we accept or deny.

Latour argues that modern societies constitute themselves *as* modern through enacting a series of dichotomies: the separation of humans from nonhumans; the separation of science from politics, and the retreat of God from the world. This allows us 'moderns' to accept three related assumptions: that society (or culture) is made by humans alone; that science (knowledge, and thus nature) is free of politics and power; and that God (morality) is either distant or something that dwells in our souls. Latour suggests that these modern mythologies – which separate people from things, divide knowledge from their constitutive practices, and relegate morality to the 'internal' space of our hearts – are immensely effective ('positive' in Foucault's terms, since they are constitutive), while at the same time they sanction an immense ignorance. Effective, because we go about our lives imagining that we make society ourselves (without the mediation of things), that science provides unambiguous truths (without being 'biased' by politics), and that morality is something we bring *to* the world (rather than something immanent in its organization). Each exists in its own domain. Precisely for this reason, we are unable to consider the way that people and things, science and politics, the world and morality, are all the while mixed together. On the one hand the modern Constitution gives us a belief in a world of distinct domains, while at the same time it leaves us blind to all the hybrid networks of people, things and politics that are being created, extended or ruptured.

Latour argues that 'we have never been modern.' Despite our belief in a world of distinct domains, these have always been tangled together. It is only we moderns who imagine that it is possible to assign things unambiguously to 'culture,' 'nature,' 'science,' and 'politics.' It is only we moderns who engage in these acts of 'purification' even as we continuously mix things together into hybrid networks through countless acts of 'translation' that go unacknowledged. It is only we moderns who imagine that ethics and politics is something that occurs solely in the realm of deliberation, rather than in the *organization* of the world. The recent professionalization of 'ethics' is merely a symptom of this, since questions of ethics are usually raised at the 'downstream' end of these acts of translation (Haraway 1997; Demeritt 2001). If there is anything that makes us truly 'modern,' Latour suggests, it is our proclivity, first, to simultaneously purify the world into essences all the while furiously producing ever new heterogeneous associations, and, second, to only *subsequently* become anxious about the results. The proliferation of networks of 'quasi-objects/quasi-subjects' that result, Latour (1993) argues, have no place in the modern Constitution, and thus *cannot be represented*. At one level, Latour's argument represents a simple call to 'bring networks out of hiding,' and thus to begin to attend to how nature, culture, machines and politics are always already tangled together.

Our fourth 'moment' is in many respects a response to this call. Before exploring it further, however, let me pause to consider how this moment throws the claims

of the previous three into crisis, since each can now be seen to accept the terms of this Constitution. Of the three, cultural ecology presents the most intriguing case, for its practitioners assumed that they had indeed managed to overcome the modern dualism that assigned 'nature' and 'culture' to separate domains. Recall, for instance, Clifford Geertz's (1963) assertion that cultural ecology did not separate the works of man from the processes of nature, but instead understood them as an *integrated whole*, since "material interdependencies . . . form a [single] community." Understood in this manner, "the sharpness of the division between analyses from the side of 'man' and analyses from the side of 'nature' . . . disappears" (p. 8). Is this not a statement that thoroughly *rejects* the modern Constitution? On the surface it would appear so. But we need to remember how this apparent unity was achieved. Again, drawing from Geertz, we learn that cultural ecology subsumes all processes "within a single analytical system, an ecosystem" (p. 2). And, moreover, we learn that cultural practices are 'adaptations' to ecological conditions, and thus essentially 'natural' in their own right. Far from providing us with a nonmodern ontology, cultural ecology fully accepts the terms of the modern Constitution. It divides the world into domains – 'culture' and 'nature' – and then collapses the former into the latter. Nothing could be more modern.

What then of political ecology? It too claims to locate a unity. Recall Blaikie and Brookfield's assertion that the world was constituted through a "constantly shifting dialectic between society and land-based resources, and also within classes and groups within society itself." Certainly this must avoid the trap that the moderns had set for themselves. Yet dialectics can be seen to simply deepen the error, imagining the world in terms of two separate domains – nature and culture – that continuously 'interact.' Worse, in practice it was only the second half of Blaikie and Brookfield's statement – the dialectical movement of "classes and groups within society itself" – that would be taken up at any length by political ecologists. Society and politics to the sociologist; ecology to the ecologist. What could be a more clear statement of the modern Constitution? On the one hand society making itself, and on the other, society 'interacting' with a nature posited as a separate, opposed, domain.

What might we say of cultural studies of the environment? For adherents of 'nonmodern ontologies' these studies would merely intensify the error, placing all the action on the side of the cultural, and leaving 'things' entirely mute and passive. For all its insights into how the world is 'made legible,' people – or language and discourse – are the only actors in these poststructuralist worlds and postcolonial dramas. As noted by Sarah Whatmore (1999, 2002), the so-called 'cultural turn' in geography resulted in the question of nature being reformulated as an exclusively epistemological one.

Against the terms of the modern Constitution and its great divides, Latour proposes a nonfoundational, or 'nonmodern,' ontology. This merits some discussion, since it speaks directly to the problematic of the relation between culture and nature with which we began, and since it also contrasts significantly with recent calls to 'bring nature back in' to cultural geography. In Western philosophy, ontology is conventionally taken to refer to the realm of Being, or the 'what is' of the world. It is commonly understood to name the immutable (which is why the turn to 'ontology' is often considered a turn away from politics). Epistemology, on the other hand, is

the question of *how* we come to know the world. Politics is commonly taken to be located in the realm of the epistemological – how to provide an adequate account of the world that can guide human action. Where Latour departs from this is that for him ontology is not the realm of the given, but the realm of experimentation or practice – a realm of *becoming* in which the final result is not known in advance, but is instead the outcome of innumerable acts of mediation, communication and translation, or, to use Latour's phrase, the "exchange of properties" (Serres uses the sports metaphor of 'passing'). Nonmodern ontologies allow for the production of ever new and novel forms, the continuous deterritorialization and reterritorialization of the world through the proliferation of connections or sudden bifurcations (see also Deleuze & Guattari 1987; Thrift 1996; Doel 1999). Here Latour is drawing on an 'orphaned' philosophical tradition that includes such figures as Henri Bergson, Baruch Spinoza, Gilles Deleuze, Michel Serres, and a common source for many, the Greek physicist Lucretius. For these philosophers the world does not consist of discrete 'things' that are brought into relation through some sort of external determination (such as found in versions of dialectics), resulting in hybrids that are mixtures of pre-given pure forms, but instead consists of flows and connections within which things are continuously (re)constituted. The difference between an ontology of form and essence (modern ontology) and an ontology of flows and connections (nonmodern ontology), is striking. Whereas the former brings us to the problem of understanding how distinct things 'interact,' the latter asks how it is that things come to attain provisional form and a certain durability. In other words, while the former takes divisions as a starting point, the latter tradition *politicizes* these divisions, asking how they came to be in the first place.

There are a number of significant implications that follow from this. First, to accept the nonfoundational ontology outlined by Latour is to reject the terms of the modern Constitution: rather than the *relation* between nature and culture presenting a puzzle to be solved, it is the division of the world into these ontological domains that needs explanation (see Whatmore 1999). Viewed from the position of nonmodern ontologies, the world does not consist of 'nature' and 'culture' and their combination, but only of heterogeneous associations that bring together diverse objects, effects and aims (Thrift 1996). Second, this presents a significant challenge for the entire field of study that has historically taken as its problematic the 'relation' between nature and culture, since its founding terms are now thrown into question. Indeed, the challenge extends beyond cultural geography, or geography as a whole, to include the very divisions of knowledge that are institutionalized in the intellectual cultures of the Western academy, which can now be seen as the one institution above all others that maintains – and is deeply *invested* in maintaining – modernity's 'great divides.' In passing, it is worth noting that to the extent that calls to 'bring nature back in' retain the notion of nature as a distinct domain they remain firmly implicated in these divides. And third, it suggests new avenues for 'interdisciplinary' research, not in terms of dividing the world into disciplinary domains and then struggling to bring them into relation, but oriented towards 'bringing networks out of hiding,' to the tracing of associations and translations.

Studies of this sort have recently appeared in the discipline of geography, and have begun to transform the study of culture and nature. Indeed, so thoroughly has this work displaced these terms that we might suggest that the nature–culture

problematic – much like the figure of 'man' – is on the verge of being erased by the incoming tide of 'nonmodern ontology.' This work has taken several forms. A number of geographers influenced by science studies have begun to explore the exchange of properties that occurs within technoscientific practices. To the extent that this research is directed toward understanding how knowledge about the world is produced, it retains similarities with the cultural studies of the environment. Yet, it departs in crucial ways. By diffusing agency throughout technoscientific networks so as to include 'things' such as machines and organisms, it refuses to imagine humans as the only actors (see Latour 1999, Haraway 1997). And, by assuming that we know reality through our connections with it, rather than by our distance from it, it throws into question the assumption that knowledge can be understood solely in terms of *signification*, and insists instead on the materiality of knowledge practices (Ingold 1995, Hayles 1995).

More recent work has begun to produce 'nonmodern' accounts of the heterogeneous associations that constitute our physical, political and cultural environments. Prominent in this area has been the work of Sarah Whatmore (2002) on topologies and political orderings of wildlife, Sally Eden et al. (2000) on river restoration, Neil Bingham (1996) on technological objects, Steve Hinchliffe (2001) on BSE, Nigel Thrift (1996, 2000) on the performativity of embodied knowledge (or 'nonrepresentational theory'), Katharyne Hayles (1999) and Neil Badmington (2003) on the 'posthuman,' and Jonathan Murdoch (1997a, 1997b) on geographical theory. As Whatmore (2002: 3) explains, work in this vein has produced

> an upheaval in the binary terms in which the question of nature has been posed and a recognition of the intimate, sensible and hectic bonds through which people and plants; devices and creatures; documents and elements take and hold their shape in relation to each other in the fabrications of everyday life.

This has profound consequences, not only for how geographers imagine research (for instance, beginning 'in the middle of things,' rather than presupposing a world of separate domains), but also for ethical-political considerations. Not only does it become difficult to imagine an ethics exclusively in terms of humans, since the 'human' is immediately displaced into its constitutive relations, it also undermines the notion of 'rights,' since these are assumed to belong – like physical qualities – to discrete and static entities. Attempts to rethink the basis for ethics and politics have focused on notions such as relationality (Whatmore 1997), drawn on Spinoza's understanding of the body in terms of affect, or sought to situate ethical thinking in terms of experimentation (Deleuze & Guattari 1990), 'eco-art' (Guattari 2000), or in terms of the 'explosive corporeal productivity' of the earth (Casarino 2002).

Like the other moments I've explored, nonmodern ontologies (and especially actor-network theory, or ANT) has its critics. A favorite target has been Latour's argument that one could not adequately explain networks through appeal to 'macro' structures whose nature is determined in advance (capitalism, reason, modernity), since these kinds of structures do not exist apart from, or prior to, the networks that constitute them. Latour argues that one must begin 'in the middle,' which is where, in the words of Deleuze and Guattari (1988) things 'pick up speed.' Many have found this inadequate, since it appears to provide no way of understanding how certain

structures or relations become generalized (such as an 'expansionary logic' inherent in capitalism). While generally convinced by Latour ontological arguments, these critics argue that ANT provides few tools for *analyzing* the world (see Castree 2002). Advocates have responded that the appeal to such explanatory categories such as the State, Capitalism or Science are more problematic, since they "render messy fragile net-workings as slick consolidated totalities" (Whatmore 2002: 168).

Others argue that ANT flattens the world in such a manner that all actors are seen as equivalent, and that this does not allow for the massive differences between people, animals, and machines (Laurier & Philo 1999). While this objection initially appears significant, it may be less so once one places in question the usual way that people are distinguished from animals and machines (i.e. through the capacity to reason). Latour and others have argued that we reason *through* things. Hence, that quality to which we appeal as humanity's most unique quality – reason – is shot through with the agency of nonhuman others. For adherents to a nonmodern ontology there is no separating people from things, subjects from objects, technologies from words. As Latour explains, even our most distinctively human propensities such as "knowledge, morality, craft, force, sociability are not properties of humans but of humans *accompanied* by their retinue of delegated characters" (1988: 310, emphasis added). In contrast to the claims of critics, what distinguishes modern human subjects is neither their mastery of, nor their alienation from, 'things,' but their extraordinary success in mobilizing them and their stunning inability to see that they are doing so! This *is* a significant distinction, but not the one that ANT's critics had expected to find.

Yet other critics have worried over the lack of normative foundations in nonmodern ontologies, since it appears that there is no basis on which to distinguish networks, assemblages, or events, whose effects are 'good,' from those whose effects are 'bad.' What kinds of associations and translations should be permitted, and which should not? No doubt Latour would respond that this is a matter of politics, since in the terms of the nonfoundational ontology that he outlines, there is no *transcendental* basis from which to evaluate. The world consists only of assemblages of different size, extent, and duration, and networks that 'fold' and 'refold' time and space in new and novel ways (see Serres & Latour 1995). What might it mean to live ethically in such a world?

Conclusion: Toward an Ontological Politics

Are we witnessing the passing of a problematic? If so, what consequences and possibilities might this open for thought and politics? At the very least the dichotomy between thought and politics would have to be discarded, since another consequence of nonmodern ontologies is to throw into question the assumption that thought is the realm of contemplation and politics the realm of action. Like the distinction between 'nature' and 'culture,' this distinction takes recourse to a notion of separate domains, and fails to understand the performative rather than reflective nature of representation. To draw again upon Deleuze and Guattari (1988), theories of representation worry over the relation between texts and meaning (or the text and the world), whereas nonrepresentational theories inquire about the way a text comes to be *connected* to other things (see also Thrift 1996). Once representation is placed

on the same plane as practice, problems of representation resolve into questions of pragmatics – a matter of practice, of making connection, of creative involvement in the world.

This is not to say that the turn to 'nonmodern ontologies' should be uncritically embraced. Serious reservations have been raised about the *basis* for such ontological claims, which are often justified through recourse to mathematics, geometry, and the physical sciences (cf. DeLanda 2002). For critics, this move evades responsibility for the initial act of positing involved in any ontological speculation (Derrida 1994). Its adherents, however, suggest that in this turn we find a hint of what comes after the 'end' of the old problematic of the 'relation' between nature and culture. Once these purified domains have been abandoned and replaced by a nonmodern ontology of heterogeneous associations, they argue, we find ourselves facing a new analytical task: no longer that of determining which direction the arrow of causation points – nature to culture, culture to nature, or some 'middle ground' that combines the two – but instead something more modest and more pragmatic: the interrogation of networks and their consequences, the careful reckoning of our intimate connections to and with other things, human and nonhuman, in what Whatmore (1999: 30) calls "the everyday business of *living* in the world." Likewise, once politics is no longer preoccupied with policing the boundaries between nature and culture, its focus shifts to the art and practice of *making* connections and taking responsibility for how they are made. It becomes performative rather than theoretical, pragmatic rather than contemplative. The categories of 'culture' and 'nature' provided little of any guidance for such a project, since by definition they were *conservative* categories – categories that retained their value only through the constant work of conserving their integrity and autonomy. That the preservation of their autonomy *required* a great deal of work is increasingly evident. That critical project is now, perhaps, finally exhausted. In its place we see the faint outlines of something different: not a politics of representation that seeks to 'get it right' and assumes a world of 'fixed forms,' but instead an *ontological politics* (Mol 1999) or a *cosmopolitics* (Stengers 1996–7) that takes as its task the active shaping of the world, rather than its proper representation.

What this means for cultural geography is less clear. Certainly the very possibility of positing a 'cultural' geography that has its own distinct 'object' is increasingly open to debate. Already we are told that distinctions between 'cultural,' 'political,' and 'economic' have been thoroughly blurred. But if we accept nonmodern ontologies, the language of 'blurred' boundaries no longer makes sense, since these categories were simply the outcome of our practices of dividing the world into domains in the first place. As much as did the original categories, the language of 'blurred boundaries' gets in the way of understanding the world as it is. A nonmodern ontology refuses these realms as distinct, either today or in the past. It is not postmodernism that 'mixes together' culture and nature, for it is only we moderns who thought they were separate in the first place! We are at a juncture when disciplinarity must again be rethought. Neither creating new disciplinary divisions nor seeking interdisciplinarity will suffice. As Sarah Whatmore (1999) notes, it no longer makes sense to 'bracket off' environmental geography as a subfield, nor does it make sense to attempt the 'reintegration' of physical and human geography. These common responses to the modern predicament merely reproduce the original errors,

as does an interdisciplinarity that seeks to 'combine' social, ecological, and economic facts. Perhaps what is needed are new ways of imagining and creatively engaging in the world, a new postdisciplinary pragmatics that accepts our *participation* in the worlding of our world and our connection to the many other 'actants' who constitute our worlds and our humanity. What we face, then, is the task of thinking in terms of a 'geophilosophy' (Deleuze & Guattari 1990) that attends to, and places us within, the creative becoming of the earth.

NOTES

1. Such 'passings' are, of course, continuously deferred, as Derrida (1982: 135) explains in the context of Heidegger's 'destruction' of humanism: "one risks ceaselessly confirming, consolidating, *relifting* [*relever*], at an always more certain depth, that which one allegedly deconstructs."
2. Clarence Glacken (1967) provides the most comprehensive historical account of the career of the nature–culture problematic in earlier periods of Western thought.
3. In a curious twist that challenges our usual temporal notions of intellectual progress, Christopher Johnson (1993) argues that cybernetics was highly influential to some French poststructuralisms in the 1960s, in part through the reception of the work of Gregory Bateson. Traces of this influence can be found in the early work of Jacques Derrida (see the opening sections in *Of Grammatology*) and more consistently in the writings of Gilles Deleuze and Félix Guattari. The poststructural turn in Anglo-American geography in the late 1980s and 1990s, then, contains certain unacknowledged repetitions.
4. Arguably 'material culture' returned in the late 1980s (see Appadurai 1986), and with a vengeance in the 1990s (see Michael 2000).
5. This was similar to the argument in favor of 'progressive contextualization' made by the cultural ecologist Andrew Vayda in 1983. Vayda and Harold Brookfield were both cultural ecologists who increasingly integrated the insights of political economy during the 1980s.
6. Williams was not the first to examine 'ideas of nature.' R. G. Collingwood's *The Idea of Nature* (1945) prefigured Williams by three decades.

REFERENCES

Agarwal, B. 1992: The gender and environment debate: lessons from India. *Feminist Studies* 18, 119–58.

Anderson, K. 1998: Science and the savage: the Linnean Society of New South Wales, 1874–1900. *Ecumene* 5, 125–43.

Anderson, K. 2001: The nature of 'race.' In N. Castree and B. Braun, eds., *Social Nature: Theory, Practice, and Politics*. Oxford: Blackwell, 64–83.

Appadurai, A., ed. 1986: *The Social Life of Things: Commodities in Cultural Perspective*. Cambridge: Cambridge University Press.

Aschmann, H. 1959: *The Central Desert of Baja California: Demography and Ecology*. Berkeley: University of California Press.

Badmington, N. 2003: Theorizing posthumanism. *Cultural Critique* 53, 10–27.

Bartram, R. 1999: The enclosure of nature in Stanley Spencer's *Hoe Garden Nursery*. *Ecumene* 6(3), 341–59.

Binde, P. 1999: Nature versus city: landscapes of Italian fascism. *Environment and Planning D: Society and Space* 17, 761–75.

Bingham, N. 1996: Objections: from technological determinism towards geographies of relations. *Environment and Planning D: Society and Space* 14, 635–57.

Blaikie, P. 1985: *The Political Economy of Soil Erosion in Developing Countries*. Harlow: Longman.

Blaikie, P. and Brookfield, H. 1987: *Land Degradation and Society*. London: Methuen.

Braun, B. 1997a: Buried epistemologies: the politics of nature in (post)colonial British Columbia. *Annals of the Association of American Geographers* 87(1), 3–32.

Braun, B. 1997b: On cultural politics, Sauer, and the politics of citation. *Annals of the Association of American Georaphers* 87(4), 703–8.

Braun, B. 2000: Producing vertical territory: geology and governmentality in late-Victorian Canada. *Ecumene* 7, 7–46.

Braun, B. 2002: *The Intemperate Rainforest: Nature, Culture and Power on Canada's West Coast*. Minneapolis: University of Minnesota Press.

Braun, B. and Castree, N., eds. 1998: *Remaking Reality: Nature at the Millennium*. London: Routledge.

Braun, B. and Wainwright, J. 2001: Nature, postructuralism, politics. In N. Castree and B. Braun, eds., *Social Nature: Theory, Practice, Politics*. Oxford: Blackwell, 41–63.

Bryant, R. and Bailey, B. 1997: *Third World Political Ecology*. London: Routledge.

Butzer, K. 1989: Cultural ecology. In C. J. Willmott and G. Gaile, eds., *Geography in America*. Washington, DC: Association of American Geographers and National Geographic Society.

Casarino, C. 2002: *Modernity at Sea: Marx, Melville, Conrad in Crisis*. Minneapolis: University of Minnesota Press.

Castree, N. 1995: The nature of produced nature: materiality and knowledge construction in Marxism. *Antipode* 27(1), 12–48.

Castree, N. 2002: False antithesis? Marxism, nature and actor-networks *Antipode* 34(1), 111–46.

Cockburn, A. and Ridgeway, J., eds. 1979: *Political Ecology*. New York: Times Books.

Collingwood, R. G. 1945. *The Idea of Nature*. Oxford: Clarendon Press.

Cosgrove, D. and Jackson, P. 1987: New directions in cultural geography. *Area* 19, 95–101.

Cronon, W. 1995: The trouble with wilderness: or, getting back to the wrong nature. In W. Cronon, ed., *Uncommon Ground: Toward Reinventing Nature*. New York: W.W. Norton & Co.

Darier, E. 1999: *Discourses of the Environment*. Oxford: Blackwell.

DeLanda, M. 2002. *Intensive Science and Virtual Philosophy*. London: Continuum Books.

Deleuze, G. 1991: *Bergsonism*, tr. H. Tomlinson and B. Habberjam. New York: Zone Books.

Deleuze, G. and Guattari, F. 1988: *A Thousand Plateaus: Capitalism and Schizophrenia*, tr. Brian Massumi. London: Athlone Press.

Deleuze, G. and Guattari, F. 1990: *What is Philosophy?*, tr. Hugh Tomlinson and Graham Burchell. New York: Columbia University Press.

Demeritt, D. 1994: Ecology, objectivity and critique in writings on nature and human societies. *Journal of Historical Geography* 20(1), 22–37.

Demeritt, D. 1998: Science, social constructivism and nature. In B. Braun and N. Castree, eds., *Remaking Reality: Nature at the Millennium*. London: Routledge, 173–93.

Demeritt, D. 2001: The construction of global warming and the politics of science. *Annals of the Association of American Geographers* 91(2), 307–37. Derrida, J. 1976: *Of Grammatology*, tr. Gayatri Chakravorty Spivak. Baltimore: Johns Hopkins University Press.

Derrida, J. 1982: *Margins of Philosophy*, tr. Alan Bass. Chicago: University of Chicago Press.

Derrida, J. 1994: *Specters of Marx: The State of Debt, the Work of Mourning, and the New International*, tr. Peggy Kamuf. New York: Routledge.

Doel, M. 1999: *Poststructuralist Geographies: The Diabolical Art of Spatial Science*. Edinburgh: Edinburgh University Press.

Duncan, J. 1980: The superorganic in American cultural geography. *Annals of the American Association of Geographers* 70, 181–98.

Eden, S. , Turnstall, S. M., and Tapsell, S. M. 2000: Translating nature: river restoration as nature culture. *Environment and Planning D: Society and Space* 18(2), 257–73.

Ehrlich, P. 1968: *The Population Bomb*. New York: Ballantine Books.

Enzensberger, H. M. 1974: A critique of political ecology. *New Left Review* 84.

Escobar, A. 1996: Constructing nature: elements for a poststructural political ecology. In R. Peet and M. Watts, eds., *Liberation Ecologies: Environment, Development, Social Movements*. London: Routledge, 46–68.

Foucault, Michel.1970: *The Order of Things: An Archaeology of the Human Sciences*. London: Tavistock.

Geertz, C. 1963: *Agricultural Involution: The Process of Ecological Change in Indonesia*. Berkeley: University of California Press.

Glacken, C. 1967: *Traces on the Rhodian Shore*. Berkeley: University of California Press.

Gregory, Derek. 2001: (Post)colonialism and the production of nature. In N. Castree and B. Braun, eds., *Social Nature: Theory, Practice, and Politics*. Oxford: Blackwell.

Guattari, F. 2000: *The Three Ecologies*. London: Athlone Press.

Gupta, A. and Ferguson, J., eds. 1997: *Culture, Power and Place: Explorations in Critical Anthropology*. Durham, NC: Duke University Press.

Haraway, D. 1992: The promises of monsters: a regenerative politics for inappropriate/d others. In L. Grossberg, C. Nelson, and P. Treichler, eds., *Cultural Studies*. New York: Routledge, 275–332.

Haraway, D. 1997: *Modest Witness@Second Millenium.Female Man© Meets OncoMouse*™. New York: Routledge.

Harris, M. 1974: *Cows, Pigs, Wars & Witches: The Riddles of Culture*. New York: Random House.

Harvey, D. 1996: *Nature, Justice and the Geography of Difference*. Oxford: Blackwell.

Hayles, K. 1995: Searching for common ground. In M. Soulé and G. Lease, eds., *Reinventing Nature?* Washington, DC: Island Press, 47–64.

Hayles, K. 1999: *How We Became Posthuman: Virtual Bodies in Cybernetics, Literature, and Informatics*. Chicago: University of Chicago Press.

Hewitt, K., ed. 1983: *Interpretations of Calamity*. London: Allen and Unwin.

Hinchliffe, S. 2001: Indeterminacy indecisions – science, policy and politics in the BSE crisis. *Transactions of the Institute of British Geographers* 26(2), 283–304.

Ingold, T. 1995: Building, dwelling, living: how animals and people make themselves at home in the world. In M. Strathern, ed., *Shifting Contexts: Transformations in Anthropological Knowledge*. London: Routledge, 57–80.

Jackson, C. 1993: "Women/Nature or Gender/History? A critique of ecofeminist 'development.' *Journal of Peasant Studies* 20(3), 389–418.

Jacobs, J. 1996: *Edge of Empire: Postcolonialism and the City*. London: Routledge.

Johnson, C. 1993: *System and Writing in the Philosophy of Jacques Derrida*. Cambridge: Cambridge University Press.

Kosek, J. 2002: *The Political Life of Forests in Northern New Mexico*. Ph.D. dissertation, Department of Geography, University of California, Berkeley.

Latour, B. 1987: *Science in Action: How to Follow Scientists and Engineers Through Society*. Cambridge: Harvard University Press.

Latour, B. 1988: Mixing humans and nonhumans together: the sociology of a door-closer. *Social Problems* 35(3), 298–310.

Latour, B. 1993: *We Have Never Been Modern*. Cambridge, MA: Harvard University Press.
Latour, B. 1999: *Pandora's Hope: Essays in the Reality of Science Studies*. Cambridge, MA: Harvard University Press.
Laurier, E. and Philo, C. 1999: X-morphising: review essay of Bruno Latour's *Aramis, Or the Love of Technology*. *Environment and Planning A* 31, 1047–71.
Luke, T. 1997: *Ecocritique: Contesting the Politics of Nature, Economy and Culture*. Minneapolis: University of Minnesota Press.
Michael, M. 2000: These books are made for walking . . . : mundane technology, the body and human–environment relations. *Body & Society* 6(3–4), 107–26.
Mol, A. 1999: Ontological politics. In J. Law and J. Hassard, eds., *Actor-Network Theory and After*. Oxford: Blackwell.
Moore, D. 1998: Subaltern struggles and the politics of place: remapping resistance in Zimbabwe's eastern highlands. *Cultural Anthropology* 13(3), 344–81.
Moore, D. 2000. The crucible of cultural politics: reworking 'development' in Zimbabwe's eastern highlands. *American Ethnologist* 26(3), 654–89.
Moore, O. K. 1957: Divination – a new perspective. *American Anthropologist* 59, 64–74.
Murdoch, J. 1997a: Towards a geography of heterogenous associations. *Progress in Human Geography* 21(3), 321–37.
Murdoch, J. 1997b: Inhuman/nonhuman/human: actor-network theory and the potential for a non-dualistic and symmetrical perspective on nature and society. *Environment and Planning D: Society and Space* 15, 731–56.
Nakashima, K. 1999: Representing nature and nation: national-land afforestation campaign and the production of the forest in 1960–1970s Japan. In T. Mizuuchi, ed., *Nation, Region and the Politics of Geography in East Asia*. Osaka: Osaka City University, 13–29.
Nietschmann, B. 1973: *Between Land and Water: The Subsistence Ecology of the Miskito Indians, Eastern Nicaragua*. New York: Seminar Press.
Odum, E. 1959: *Fundamentals of Ecology*, 2nd ed. Philadelphia: W. B. Saunders.
Peet, R. and Watts, M. 1996: Liberation ecology: development, sustainability, and environment in an age of market triumphalism. In Peet and Watts, eds., *Liberation Ecologies: Environment, Development, Social Movements*. London: Routledge, 1–45.
Peluso, N. 1995: Whose woods are these? Counter-mapping forest territories in Kalimantan, Indonesia. *Antipode* 27(4), 383–406.
Rappaport, R. 1967: *Pigs for the Ancestors: Ritual in the Ecology of a New Guinea People*. New Haven: Yale University Press.
Rocheleau, D., Thomoas-Slayter, B., and Wangani, E., eds. 1996: *Feminist Political Ecology: Global Issues and Local Experiences*. London: Routledge.
Rorty, R. 1980: *Philosophy and the Mirror of Nature*. Oxford: Blackwell.
Schmidt, A. 1971: *The Concept of Nature in Marx*. London: New Left Books.
Schroeder, R. 1999: *Shady Practices: Agroforestry and Gender Politics in the Gambia*. Berkeley: University of California Press.
Sen, A. 1981: *Poverty and Famine*. Oxford: Oxford University Press.
Serres, M. and Latour, B. 1995: *Conversations on Science, Culture and Time*, trans. R. Lapidus. Ann Arbor: University of Michigan Press.
Shiva, V. 1988: *Staying Alive: Women, Ecology and Development*. London: Zed Books.
Sluyter, A. 1996: The ecological origins and consequences of cattle ranching in sixteenth-century New Spain. *The Geographical Review* 8, 161–77.
Sluyter, A. 1997: On excavating and burying epistemologies. *Annals of the Association of American Geographers* 87(4), 700–3.
Sluyter, A. 1999: The making of the myth in postcolonial development: material-conceptual landscape transformation in sixteenth-century Veracruz. *Annals of the Association of American Geographers* 89(3), 377–401.

Smith, N. 1984: *Uneven Development: Nature, Capital and the Production of Space*. Oxford: Blackwell.

Smith, N. and O'Keefe, P. 1980: Geography, Marx and the concept of nature. *Antipode* 12(2), 30–9.

Soulé, M. and Lease, G., eds. 1995: *Reinventing Nature? Responses to Postmodern Deconstructionism*. Washington: Island Press.

Stengers, I. 1996–7: *Cosmopolitiques*, 7 vols. Paris: La Découverte.

Steward, J. 1955: *Theory of Culture Change: The Methodology of Multilinear Evolution*. Urbana: University of Illinois Press.

Susman, P., O'Keefe, P., and Wisner, B. 1983: Global disasters: a radical interpretation. In K. Hewitt, ed., *Interpretations of Calamity*. London: Allen and Unwin, 263–97.

Taussig, M. 1986: *Shamanism, Colonialism and the Wild Man: A Study in Terror and Healing*. Chicago: University of Chicago Press.

Thrift, N. 1996: *Spatial Formations*. London: Sage.

Thrift, N. 2000: Still life in nearly present time: the object of nature. *Body and Society* 6(3–4), 34–57.

Turner, B. L. 1989: The specialist-synthesis approach to the revival of geography: the case of cultural ecology. *Annals of the Association of American Geographers* 79(1), 88–100.

Vayda, A. 1967: Foreword. In R. Rappaport, *Pigs for the Ancestors: Ritual in the Ecology of a New Guinea People*. New Haven: Yale University Press.

Vayda, A. 1983: Progressive contextualization: methods for research in human ecology. *Human Ecology* 11, 265–81.

Vayda, A. and Rappaport, R. 1968: Ecology, cultural and non-cultural. In J. Clifton, ed., *Introduction to Cultural Anthropology: Essays in the Scope and Methods of the Science of Man*. New York: McGraw Hill.

Watts, M. 1983: *Silent Violence: Food, Famine and Peasantry in Northern Nigeria*. Berkeley: University of California Press.

Watts, M. 1998: Nature as artifice and artifact. In B. Braun and N. Castree, eds., *Remaking Reality: Nature at the Millennium*. London: Routledge, 243–68.

Watts, M. 2001: Political ecology. In E. Sheppard and T. Barnes, eds., *The Companion of Economic Geography*. Oxford: Blackwell, 257–74.

Whatmore, S. 1999: Human geographies: rethinking the 'human' in human geography. In D. Massey, J. Allen, and P. Sarre, eds., *Human Geography Today*. Cambridge: Polity Press, 22–39.

Whatmore, S. 2002: *Hybrid Geographies: Natures, Cultures, Spaces*. London: Sage.

Williams, R. 1980: *Problems in Materialism and Culture: Selected Essays*. London: Verso.

Wilson, A. 1992: *The Culture of Nature: North American Landscape from Disney to the Exxon Valdez*. Oxford: Blackwell.

Wolch, J. and Emel, J., eds. 1998: *Animal Geographies: Place, Politics, and Identity in the Nature–culture Borderlands*. London: Verso.

Wolf, E. 1972: Ownership and political ecology. *Anthropological Quarterly* 45, 201–5.

Zimmerer, K. 1996: Ecology as cornerstone and chimera in human geography. In C. Earle, K. Mathewson, and M. Kenzer, eds., *Concepts in Human Geography*. Lanham, MD: Rowman and Littlefield, 161–88.