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What is the 'social construction of nature'? A typology and sympathetic critique

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Abstract: This paper seeks to clarify what is meant by the 'social construction of nature', which has become a crude but common term used to describe very different understandings of nature, knowledge and the world. I distinguish two broad varieties of construction talk in the social sciences: construction-as-refutation and construction-as-philosophical-critique. The first uses the construction metaphor to refute false beliefs about the world and is consistent with orthodox philosophical stances, such as positivism and realism. By contrast, I identify four other, more radical sorts of construction-as-philosophical-critique that use the construction metaphor to question the culture/nature, subject/object and representation/reality dualisms that provide the conventional philosophical foundation for distinguishing true conceptions of nature from false ones. Another source of confusion has been the question of precisely what is meant by the term 'nature'. Making distinctions among different senses of that term can provide some badly needed clarity in debates about the social construction of nature. It also highlights a broad difference between those for whom the social construction of nature refers to the construction of our concepts of nature and those for whom the construction of nature refers to the process of constructing nature in the physical and material sense. That distinction, in turn, suggests two major, if also somewhat related, points of theoretical contention: first, the epistemological significance of understanding concepts of nature as constructed; second, the philosophical and political implications of arguing that nature is a socially constructed and contingent phenomenon. These are difficult philosophical and political questions, and the variety of constructionisms suggests that it is possible to answer them in a number of different ways.

Key words: actor-network theory, cultural geography, discourse, environmental studies, nature, phenomenology, poststructuralism, social construction, social problems.

I   Introduction

The 2001 Association of American Geographers Conference in New York was remarkable for the volume of debate about the 'social construction of nature'. The phrase featured in the title or abstract of 22 papers as well as in a number of panel discussions and informal chitchat at the conference.[1] This outpouring of interest speaks to widespread concerns about the state both of the planet and of our discipline. Nature and the environment are central to the self-image of geography and yet they are also increasingly contested terms within the academy and beyond. Recent work in critical human geography has challenged the apparent self-evidence and ontological fixity of nature so as to highlight the role of power relations in socially constructing and thus also potentially alleviating environmental problems and resources (e.g., Castree and Braun, 1998; 2001; Demeritt, 2001a; 2001b; Proctor, 1998). These claims have spawned strident objections. Some worry that constructionist arguments fail to take seriously the physical reality of nature, which demands our respect, if not for its own sake then because it will impact us materially in ways we will never be able to understand or ameliorate so long as we regard it as a mere projection of social interests. Others complain that characterizing scientific knowledge of, for example, climate change as a social construction is tantamount to relativism and encourages political quietism in the face of urgent environmental problems (Dunlap and Catton, 1994; Schneider, 2001). Most constructionists, in turn, deny these charges, though often for different and not always clearly articulated reasons.[2]

I have become increasingly frustrated with this debate. The 'social construction of nature' is spoken about in such different and often imprecise ways that its precise meaning and implications can be difficult to understand and evaluate. Though I have my own personal views, my objective in this review essay is less to advocate a particular answer than to clarify the major theoretical questions at issue in the debate. I begin by spelling out the different kinds of construction talk. Social construction arguments are also applied to other things, but there are also some issues specific to 'nature', which I try to resolve in the next section by defining more closely three different senses of this most complex of terms. Parsing its various meanings suggests a preliminary distinction between claims about the social construction of our *concepts* of nature and of nature in a material and physical sense. However, that distinction is controversial. Many people find construction talk attractive because it provides a way to break down the dualisms implied by this distinction and to discuss the relations between conceptual and material manifestations of nature and the environment. Nevertheless, the distinction points to two major, if also somewhat related, points of theoretical contention: first, the epistemological significance of understanding concepts of nature as constructed; second, the philosophical and political implications of arguing that nature is a socially constructed and contingent phenomenon. Different varieties of construction talk imply different takes on those issues.

II   Kinds of construction talk

Talk of social construction is now as common as it is varied. Many geographers associate it with postmodernism, itself of course a rather polymorphous term. For

instance, Dear (1994: 298) identifies construction talk with postmodernism and the essentially epistemological recognition of the 'relativism and ambiguity' of representation, which he regards as 'liberating' for the social sciences. Not all proponents of construction talk see it in this way, or for that matter even identify it with postmodernism. Within philosophy, the construction metaphor has a complex history stretching back to Kant, and even further to Plato. In the philosophy of mathematics, constructivism is the name for a body of thought concerned with the metaphysics of geometry and other abstract mathematical objects of pure thought (Table 1). Mathematical constructivists hold that such mathematical entities cannot be said to exist until they have been built up by mathematical proofs of their existence (Hacking, 1999: 45–46). While there are some connections between philosophers' mathematical constructivism and the kinds of construction talk prevalent within the social sciences, social scientists have tended to focus much more on the social processes of construction than philosophers. The corollary of this, however, is that social scientists have often been less than explicit about the philosophical implications of construction talk (Demeritt, 1996). One way to capture these differences is to follow Hacking (1999) in calling social science varieties of construction talk 'constructionism' to distinguish them from the much longer established traditions of constructivism within philosophy.

1   Construction-as-refutation and construction-as-philosophical-critique

Hacking (1999) also distinguishes between two broad kinds of constructionism. The first, and probably most common, is social construction-as-refutation. Its proponents use construction talk to falsify particular claims about the world. Typically such refutations are politically motivated and, as I will discuss below, work by 'denaturalization' or 'deconstruction'. That is, critics use construction talk to refute taken-for-granted beliefs about the essential nature of things – like gender differences – by showing that those things are not natural at all, but instead are somehow socially constructed. Such arguments involve an implicit call to action. The objective of denaturalization is to show that something is bad and that we would be better off if it were radically changed, which becomes conceivable once we realize it is socially constructed and within our power to change. Smith (1984) calls such politically paralysing false beliefs in the naturally pre-ordained state of things 'the ideology of nature'. For Marxists, denaturalizing our concepts of nature is simply a form of ideology critique. The use of construction-as-refutation rhetoric is just the latest fashion in a long-standing tradition of speaking truth to power. Yet denaturalizing political critiques are hardly unique to Marxists. Indeed they are perhaps the greatest legacy of the Enlightenment faith in the power of human rationality to dispel the darkness of ignorance.

It is important to recognize that refutationist claims about the social construction of *particular* beliefs or entities do not amount to *universal* claims about the social construction of all knowledge or entities, as indiscriminate critics of social constructionism so often imply. Instead, as Hacking (1998: 63) notes: 'The ghost of Karl Popper is at work in this [construction-as-refutation] . . . denouncing bad science.' As the reference to Popper suggests, construction-as-refutation arguments are consistent with some quite traditional epistemological stances. People resorting to this first kind of construction talk are often steadfast defenders of empiricism, positivism or critical realism. As such,

Table 1 Theories of the social construction of 'nature'

	Philosophical constructivism and constructionalism	Social scientists' constructionism-as-refutation	Phenomenological	SSK	Social scientists' constructionism-as-philosophical-critique	
					Discursive	ANT
What is constructed?	Concepts, linguistic categories, abstract mathematical entities of pure thought	Mistaken ideas and ideologies of nature (i), (ii) and (iii)	Social and environmental problems, nature	Scientific knowledge and natural phenomena	Concepts of nature; in some versions also material manifestations of nature	Quasi-objects, material-technical semiotic objects
How?	Conceptually through proof or pure thought	Variously, but often through the influence of hegemonic power	Intersubjectively through claims making	Negotiations among scientific actors	Through language and discourse	Through the practical articulation of heterogeneous human and non-human actors
Metaphysics	Nominalist; sceptical about the existence of unobserved or unobservable entities and metaphysical	Support the metaphysical idea of reference and the notion that concepts of nature (i), (ii), and (iii) can be tested empirically by reference to how nature actually is	Agnostic about truth of concepts of nature (i), (ii) and (iii) and about existence of natural phenomena, but realist about society and social actors	Various approaches to truth and reality of nature (i), (ii) and (iii) from phenomenological agnosticism to neo-Kantian ontological idealism. Realist about society and social actors	Various. Generally nominalist; sceptical of absolute ontological distinction between representation and reality, nature and society; critical of metaphysical reference	Critical of metaphysical reference; see 'nature' and 'society' as the outcome of heterogeneous processes, rather than as the starting-point for explaining those processes
Key proponents	Hacking (1999)	Various	Hannigan (1995), Spector and Kitsue (1987)	Woolgar (1988)	Butler (1993); Escobar (1996); Haraway (1991)	Latour (1999)

they are opposed to the broader metaphysical claims associated with postmodernism and other varieties of construction talk. While proponents of construction-as-refutation agree with the postmodernist Dear (1994: 298) that construction talk can be 'liberating', they say so for very different reasons. In keeping with the Enlightenment tradition of using reason to dispel ignorance and superstition, they find construction-as-refutation talk invaluable, because often the first step in the process of refuting a particularly well-established belief is to explain how that false belief was socially constructed and sustained in the first place.

Hacking (1999) suggests that a second broad variety of constructionism is more philosophical in its aims. It is concerned with situating human knowledge socially or alternatively with advancing an understanding of reality or specific entities as socially produced, rather than as simply given with fixed ontological properties. These more metaphysically inclined varieties of constructionism are aimed against certain philosophical understandings of objectivity, truth and reality, and the ideology of pious reverence for science they can produce. It is in this context that construction talk is often identified with the heterogeneous but heterodox claims of postmodernism. We might usefully identify such metaphysically inclined varieties of constructionism as 'construction-as-philosophical-critique' to distinguish them from the more explicitly political objectives of construction-as-refutation. While provisionally helpful, it is important to recognize the degree to which even the more explicitly metaphysical forms of constructionism are necessarily political as well as philosophical. As Latour (1993: 15–16) suggests, the reason that the debates about constructionism have become so contentious is that 'questions of epistemology are also questions of social order'.

It is possible to make some further distinctions within Hacking's broad variety of construction-as-philosophical-critique by noting that there are four distinct sources of constructionist talk in the social sciences and humanities (Table 1).

2   Phenomenological constructionism

Phenomenological constructionists argue that 'cultural groups . . . construct and redefine their realities . . . through ongoing social interactions' (Greider and Garkovich, 1994: 6; cf. Berger and Luckman, 1966; Harrison and Burgess, 1994; Eder, 1996; Hannigan, 1995; Macnaghten and Urry, 1998; Williams, 1998). Sociologists have pursued a similarly phenomenological approach to understanding social and environmental problems 'as products of particular constructions of social reality, rather than necessarily of actual physical conditions' (Spector and Kitsue, 1987: 38). This distinction between 'social reality' and 'actual physical conditions' is important because it signals an agnosticism about both the existence of the problems under investigation and the truth of any claims about them by research subjects. Most (but not all; see Best, 1993) phenomenological constructionists prefer to avoid making such judgements. Instead, they maintain that 'the sociologist's job is to attempt to account for the emergence, organisation, and maintenance of claims making activity' through which social and environmental problems are constructed as such (Burningham and Cooper, 1999: 304).

Such agnosticism has important political and philosophical implications. Politically, it involves an attitude of detachment (and an associated rhetoric of scientific objectivity) from the problems being described that is very different from the explicit political

commitments motivating much construction-as-refutation. Unlike self-styled critical geographers, phenomenological constructionists seek merely to describe the world, not to judge or change it. Philosophically, their agnosticism has meant that they have rarely felt the need to discuss the philosophical commitments implied by their construction of nature talk or their methodological empiricism about social facts. Such reticence makes this empirical style of phenomenological constructionism quite different from the tradition of transcendental phenomenology. Transcendental phenomenology was one important strand in the theoretical critique of spatial science. Transcendental phenomenologists sought to critique philosophically the metaphysics subscribed to by empiricist, logical positivist and realist human geographers (Pickles, 1985). Such explicit theoretical discussion is uncommon among phenomenological constructionists. As a result it is not clear whether their phenomenologically inspired construction talk is committed to the transcendental metaphysics of Pickles (1985, quoted in Gregory, 2000: 579), for whom 'we exist primordially not as subjects manipulating objects in the external ''real'', physical world, but as beings in, alongside and toward the world', or merely to a descriptive phenomenology concerned with disclosing empirically the preconceptions and social interactions necessary to construct a social problem as such.

Despite its methodological agnosticism, some ontological commitments seem to be implicit in phenomenological approaches to the construction of nature. Their focus on intersubjective claims-making activity suggests that for phenomenological constructionists the process of construction is cognitive. Indeed conceptual interpretation or construal is the second major connotation of the word 'construction' (*Webster's new collegiate dictionary*, 1977). As the cognitive construction of concepts, phenomenological construction takes no stand on the question of whether what is cognitively constru(ct)ed is materially constructed. Thus, it is possible for different phenomenological constructionists to subscribe to different views of the relationship between the ontological status or existence of what is constru(ct)ed and intersubjective claims-making about it.

3   Sociology of scientific knowledge (SSK)

A second major source of construction talk in the social sciences and humanities is SSK (Golinski, 1998; Hess, 1997). By adopting the 'symmetry principle', the strong programme in SSK extended sociologists' traditional concerns with non-scientific beliefs to explaining socially the once sacrosanct and epistemologically self-evident belief in scientifically valid knowledge and phenomena. According to the symmetry principle, scientific beliefs held to be true should be analysed in the very same constructionist terms as those regarded as false. Methodologically, the strong programme shares much in common with phenomenological approaches to constructionism, including its empiricism about social facts and its moral detachment from the constructions being studied. Indeed, a number of early ethnomethodological approaches to SSK were directly influenced by phenomenology (e.g., Knorr-Cetina, 1981). Accordingly, the metaphysical commitments of SSK are often as difficult to pin down as those of phenomenological constructionism. The symmetry principle demands that the investigator refrain from judging the truth, reality and morality of the phenomena whose construction is being explained socially. However, the methodological

commitment to empiricism about social facts has meant that the strong programme has not treated its own representations with the same scepticism as those of the scientists it studies. Advocates of reflexivity insist that SSK cannot remain immune from the caustic logic of the symmetry principle. They argue that the critique of representation should be made more complete by turning reflexively back in on SSK itself and its traditional empiricism towards social facts. This reflexive programme in SSK uses multiple voices and other experimental forms to call attention to the way in which monovocality is a conventional trope for constructing truth and epistemological certainty (e.g., Ashmore, 1989).

Some SSK scholars have advanced explicit metaphysical claims. Woolgar (1988: 65), for instance, uses social construction in the very strongest and most literal sense: the material construction of the objects of scientific thought and representation. Such a claim amounts to neo-Kantian ontological idealism that reverses 'the presumed relationship between representation and object'. Woolgar claims that the actual phenomena known by science are themselves socially constructed in the same way that national identity or beautiful music are: it is only our conventional belief in their existence that makes them ontologically 'real'. The adjective 'social' is very appropriate for such constructionism. It emphasizes that this kind of neo-Kantian constructionism is 'essentially human centered' and acknowledges only human actors. Collins and Yearley (1992: 310) insist that 'the apparent[ly] independent power of the natural world is granted by humans in social negotiation'. Other SSK scholars have been more circumspect about the ontological idealism this implies (Bloor, 1996). The precise philosophical implications of SSK have been debated extensively both within the field (Collins, 1996; Murphy, 1994; Pickering, 1992; Sismondo, 1996) and beyond (Gross and Levitt, 1994; *Nature*, 1997; Sokal and Bricmont, 1998). There is some question about whether Woolgar and other SSK practitioners actually subscribe, like Berkeley, to ontological idealism or whether, in the spirit of Hume, they are merely being polemical and using forms of ontologically idealist, neo-Kantian constructionism to question taken-for-granted beliefs about scientific phenomena.

SSK scholars have also debated the political implications of their radical scepticism about scientific knowledge claims. Although the early work of the strong programme was broadly inspired by neo-Marxist understandings of hegemony and determination, it was not engaged much politically outside the academy.[3] Recently, however, SSK has begun to consider the degree to which academic analysis of the social construction of science either does or should involve 'taking sides' with the underdog (or being captured by powerful interests) in contested political debates about the warranting of claims to, for example, repetitive stress injuries or carcinogenic chemical agents (Scott *et al.*, 1990; Collins, 1991; Ashmore and Richards, 1996).

4   Discursive constructionisms

Third, following broad currents within poststructuralism and hermeneutics, other formulations have emphasized 'the role of language in the construction of social reality' (Escobar, 1996: 46). It is common to refer to the 'linguistic turn' in the social sciences, but in fact there have been several. Approaches to the 'discursive construction' of nature are variously indebted to Foucaultian ideas of the power/knowledge relations 'by which the ''inert objectness'' of nature [is] constructed' (Braun, 2000: 13; cf. Darier, 1999), to

phenomenological approaches to discourse analysis in linguistics and social psychology (Hajer, 1995; Harré *et al.*, 1999), to ethnographic traditions of intersubjective dialogue (Bird, 1987; Leibhardt, 1988), to literary theories of textuality, which dramatize the role of representation in mediating and thereby constructing nature for us (Myers, 1990; Willems-Braun, 1997), and even to psychoanalysis (Butler, 1993; Giblett, 1996). Given this theoretical diversity, it is not clear that different invocations of the term necessarily all mean the same thing, either philosophically or politically. What different approaches to 'discursive construction' seem to share in common is a concern with power and its effects. In that sense, advocates of discursive construction tend to see themselves as engaged in political critique: not just standing back and describing the ways nature is socially constructed, like phenomenological constructionists and SSK, but also seeking to diagnose the effects of those constructions and thereby also to change them.

Such critiques could be made more convincing, as well as, perhaps, more diagnostically acute, through greater terminological precision. Sometimes 'discursive construction' seems to be intended as a kind of refutation. In such cases, it would be better simply to call a particular conception of nature wrong rather than muddying the waters by invoking the notion of discursive construction. By contrast, phenomenological and linguistic approaches to the 'discursive construction' of nature (and of other things) suggest the metaphysical argument that for us 'nature' is only ever constru(ct)ed. This amounts to a nominalist, veil of perception argument: we can never escape the prison of language to know if our conceptual constructions of 'nature' correspond to how nature actually is. It is a plea for epistemic caution in the face of the ultimate mysteriousness of the world.

Much SSK might also be read as broadly consistent with this philosophical stance, but there are three important differences. First, the influences of poststructuralism mean that discursive constructionists are often more theoretical in tone than the more empirically documented style of SSK. Second, whereas the strong programme of SSK based its scepticism about natural facts on an empiricist approach to the social ones invoked to explain the construction of nature, the epistemic nominalism of discursive constructionism, like that of the reflexive programme in SSK, is more thorough. It calls into question the representation/reality and subject/object dualisms that have underwritten Enlightenment science and its claims to truth. As a result, discursive constructionism raises questions about the basis for warranting its own claims and about the ontological limits of its constructionism, which I explore later in this paper. Finally, discursive constructionists tend to be much more critical of technoscience than proponents of SSK, who, as Winner (1996) notes, tend to hold degrees in the sciences, to be attached to science faculties and thus to be supportive, if not even admiring, of the sciences and scientists they study. In the context of politicized debates about climate change, nuclear power and genetic engineering, the sceptical nominalism of discursive constructionists is often intended to deflate expert confidence about the knowability and therefore manageability of these risks, to highlight the potential for systemic indeterminacy and to call for a precautionary approach to dealing with them (Wynne, 1992).

In spite of this prevailing nominalism, some versions of discursive construction do advance strong ontological claims about the materiality of nature's construction. Some are aligned to a Heideggerian metaphyics in which 'nature and the other things-in-the-world are disclosed to us as objects through practical and embodied engagements that

materially configure them in ways that are recognizable *for* us and ontologically trans-forming *of* us' (Demeritt, 2001a: 311). This kind of mutual construction of nature and society involves a rejection of the subject/object, nature/society dualisms central to both anthropocentrism and essentialism. As such, it shares something in common with the project of transcendental phenomenology (Pickles, 1985). Some environmental ethicists see such a metaphysical renunciation as politically progressive because it implies an ecocentric call for humans to learn to let beings be (Zimmerman, 1983). At other times, there is more than a hint of ontologically idealist neo-Kantian construc-tionism in claims that 'Poststructuralism ... treats language not as a reflection of "reality" but as constitutive of it' (Escobar, 1996: 46). However, the scare quotes might also be interpreted either as a plea for nominalism or as a kind of descriptive phenom-enology that is agnostic about the truth or reality of particular conceptions of nature.

Critics complain that such a philosophical stance is relativist and politically dangerous, in so far as its nominalism about truth and reality licenses industrial polluters in their denials both of the real environmental damage they cause and of any objective scientific proof of it (Worster, 1990; Soule and Lease, 1995; Gandy, 1996; Proctor, 1998). Some proponents of discursive constructionism have responded by seeking to dispel any hint of ontological idealism by insisting on the active role of nature 'in negotiating reality ... Nature's role in that negotiation takes the form of actively creating something materially new and of resisting or accommodating the range of metaphorical and theoretical imaginings with which it is approached' (Bird, 1987: 25). But what then, are the metaphysical differences between such a 'constrained' constructionism and good old-fashioned realism (Hayles, 1991)? To distinguish discursive construction from conventional realism while still acknowledging the materiality of nature, other poststructural theorists contend that 'materiality [must] be rethought as the effect of power', as something that 'is both marked and formed by discursive practices' (Butler, 1993: 2, 1). This formulation then begs questions of what is meant by power and by discursive practices, how their ontological status is to be understood, and how claims about them are to be warranted. Such conceptual ambiguity makes it difficult to understand and thereby to evaluate many of the claims being made under the banner of discursive constructionism.

5   Actor-network theory (ANT)

Talk of construction has also drawn on ANT and other theories of embodied practice, which are influential in but genealogically distinct from SSK. Latour (1999: 156) proposes a radical metaphysics of 'relative existence' in which determinations of epis-temological truth and ontological reality are contingent and depend on the strength of heterogeneously assembled actor networks of human and non-human entities. 'Nature', for Latour (1999: 311), only ever emerges as such, that is, as an apparently purified entity, as the 'result of a settlement that, for political reasons, artificially divides things between the natural and the social realms'. Likewise Haraway (1991) embraces cyborg imagery to unsettle the ontological purity of nature and society. They are instead, Haraway (1997: 141; cf. Haraway, 1992) suggests, contingent and artifactual constructions that emerge from the practical 'interactions of humans and nonhumans in the distributed, heterogeneous work processes of technoscience'. While Pickering (1995) also emphasizes metaphysical contingency, he is critical of the language of

constraint implied both by Latour's (1987) 'trials of strength' and by other versions of constructionism in which the contingency of scientific results is somehow 'constrained' by reality (Hayles, 1991). Instead Pickering's (1995) account of the mangle of scientific practice emphasizes the unfolding 'dialectic of resistance and accommodation' among scientists, abstract theories, laboratory instruments and experimental phenomena though which these entities emerge as such.

There are also traces of Deleuze in this fourth variety of construction talk. Doel (1999: 198), for instance, combines Deleuze's rhizomatics with Latour's ANT to emphasize an ambivalent ontology of folds and flows that is open to 'multiple becomings in every body'. He quotes the French poststructural philosopher Deleuze (1993: 5):

> Matter thus offers an infinitely porous, spongy, or cavernous texture without emptiness, caverns endlessly contained in other caverns: no matter how small, each body contains a world pierced with irregular passages, surrounded and penetrated by an increasingly vaporous fluid.

Like much of the work that Deleuze has inspired, this passage is somewhat inscrutable. It seems to imply a view of ontology that is indeterminate and is therefore unsympathetic to absolute knowledge claims about the essential nature of beings. As Doel (1999: 21–22) explains, the potential for deconstructive folding means '[o]ne can no longer decide where things fall' and boundaries lie as 'the (s)playing out of differential relations engenders an invaginating torque that turns the inside out and the outside in'.

With its emphasis on flux, contingency and hybridity (Whatmore, 1999), ANT appears to share some metaphysical commitments with the dialectical ontology of internal relations outlined by Harvey (1996) and underwriting some Marxist understandings of nature and its material production under capitalism (e.g., Swyngedouw, 1999). However, ANT formulations of nature's construction are often both more epistemologically modest and less politically self-confident than many proponents of the production of nature in political ecology (e.g., Blaikie, 1996), who worry that their political critiques of actual environmental problems will lose their efficacy without firm philosophical foundations.[4]

6   Making sense of constructionisms

The diversity of constructionist talk, combined with the fact that many constructionists have been influenced by more than one of these intellectual wellsprings, makes it difficult to generalize. As much as anything else, what proponents of construction talk seem to share in common is an attitude that is both sceptical and humanist. Constructionists insist that things are not as they seem. The metaphor of construction enables them to argue that what we had once accepted as self-evidently pre-ordained and inevitable is in fact contingent and might conceivably be remade in some other way, if only we would try. If constructionist arguments involve a sceptical attitude, they can take a number of different forms that involve different philosophical and political commitments. However, they all 'dwell in the dichotomy between appearance and reality set up by Plato, and given a definitive form by Kant. Although social constructionists bask in the sun they call postmodernism, they are really very old-fashioned' (Hacking, 1999: 49).

Despite this diversity, many critics have reacted with undifferentiated hostility, condemning all social construction talk as part of a generalized 'flight from reason' and

reality (Gross *et al.*, 1996). Not surprisingly, perhaps, the result of such polemicism is often gross misrepresentations of particular traditions of thought. This tendency to ignore intellectual distinctions and collapse bodies of very different work into undifferentiated categories is perhaps best represented by Gross's and Levitt's (1994) theoretically incoherent assault on the 'academic left'. Not only, as I have already suggested, do such attacks ignore the great variety of construction talk, but they also greatly oversimplify its political origins and orientation. Both Sokal and Bricmont (1998) and Gross and Levitt (1994) matter-of-factly identify SSK and other versions of construction talk with the 'Academic Left', but one of the most remarkable and politically influentially examples of social construction-as-refutation is the effort by conservative ideologues in the USA to refute scientific theories of global warming as merely social constructions (McCright and Dunlap, 2000).

Arguments about the social construction of nature can work in a number of different ways to a variety of different political ends, but neither the politics nor the philosophy they imply will be very clear until we take some more care in defining our terms. Sometimes crisp distinctions can dispel controversy by demonstrating that it involves merely trivial disagreements. But debates over social constructionism also involve some fundamental philosophical and political issues, and terminological precision can help us appreciate them better.

III The construction of what 'nature'?

One difficulty specific to debates about the social construction of nature is that the very word 'nature,' as the literary critic Raymond Williams (1983: 219) has famously observed, 'is perhaps the most complex in the [English] language'. Williams distinguishes three specific, but closely intertwined, meanings of the word 'nature'.

(i)   The essential quality or character of something (X). In so far as certain qualities of (X) are taken to be essential and ontologically necessary to defining the very nature of (X), this sense of nature (i) is also associated in the depth ontology of critical realism with ideas about the 'real'. Many social construction arguments take the form of anti-essentialism about (X). It is argued that the nature (i) of (X) is not an essential quality but is contingent and socially constructed. Such debates do not question the reality, in the sense of the existence, of (X) but instead turn on the issue of its necessity as an ontologically defining and in that sense 'real' feature of (X).

(ii) The inherent force which directs either the world or human beings or both. This sense of an abstract and universal 'nature' also has important ontological (e.g., the biologically innate or instinctive) and normative (e.g., behaviours like homosexuality have long been condemned as 'unnatural') implications. It was associated historically with the emergence of universal and therefore scientifically predictable laws of nature governing the behaviour of all things. In so far as these natural laws, in the sense of (ii), determine the quality and nature, in the sense of (i), of (X), there is some overlap between nature (i) and (ii). Thus debates about the social construction of (X) may conflate two logically distinct issues: first, whether or not (X) is an essentially necessary and ontologically defining, natural (i) quality of (X); second, whether this feature is social in origin or is somehow determined naturally, in the sense of (ii).

(iii) The external, material world itself. This sense of nature (iii) is associated with 'reality', in the sense of totality, and contrasted with senses of the imaginary or conceptual. Another ambiguity is whether humans are inside or outside this nature (iii). Historically the categorization of different social groups as either inside or outside nature has often been expressed in hierarchical or evolutionary terms. Whereas primitive peoples are often represented as living in a state of wilderness nature (iii), in which they are subject to the universal laws of nature (ii), more modern people are imagined as having escaped these biological imperatives (ii) in a state of civil society that is based on dominating an external natural environment (iii) (Willems-Braun, 1997). This dualism between primitive people living within nature (iii) and civilized people living outside it has alternatively been read so as to legitimate the dispossession of native peoples for failing to improve and cultivate wilderness nature (iii) or alternatively to critique modern people for dominating and destroying the natural environment (iii). Either way, it is a dualism that lends itself easily to gendered and racialized stereotyping (Soper, 1995).

The ontological question of what is 'nature' has important epistemological implications because various senses of 'nature' have been used to establish a foundation for truth and science. First, scientific knowledge is sometimes defined as the explanation of what is natural, in the sense of either (i) or (ii). To this naturalistic view, what human and physical geographers share in common is a search for the essentially necessary, intransitive and therefore scientifically predictable properties or laws governing their respective objects of study. But other senses of nature have been used to distinguish the social sciences, concerned with meaningful human affairs, from the natural sciences, which study brute physical nature in the sense of (ii) or (iii) or both. This ontological difference between nature and society then forms the basis for distinguishing epistemologically between human geographers' subjective understanding of the social world and physical geographers' objective scientific knowledge of the natural. As a result of this second great divide, the disciplines of geography and anthropology, which concern themselves with both culture and nature, have had to endure internecine battles between their physical and cultural wings. Other disciplines have had even more trouble coming to terms with what Fitzsimmons (1989) calls the 'matter of nature'. This sharp distinction between nature and society left traditionally 'social' disciplines like sociology and history with nothing at all to say about environmental issues. This has only recently begun to change with the emergence of environmental sociology and environmental history, which have gone beyond ideas of nature and their conceptual construction to include nature, in the sense of (ii) and/or (iii), as a legitimate actor in sociological and historical narratives (Demeritt, 1994; Irwin, 2001).

Parsing these various meanings of 'nature' suggests two broad ways to understand their social construction. The first proceeds from the realization that all these interrelated meanings of 'nature' depend upon linguistic oppositions to that which is said to be cultural, artificial or otherwise human in origin. This constitutive opposition of meanings of the natural to the cultural is particularly significant for (ii) and (iii), but also applies to many senses of (i). Since the cultural references against which nature is defined change over time and space, so too must ideas of what nature is. Thus a first very general way in which 'nature' might be said to be a social construction is as a culturally and historically specific *concept*. This sense of conceptual construction applies

to more than just nature. Claims about the social construction of any (X) might also be understood as claims pertaining to the social construction of our knowledge and concepts of (X). Phenomenological construction is largely about these social processes of construal and conceptualization. But *concepts* of nature are also what many forms of discursive construction are concerned with explaining. SSK and ANT approaches to constructionism often place more emphasis on the practical engagements through which what counts as 'nature' is materialized, but, when they refer to the construction of nature, part of what they mean is the construction of our concepts of nature.

Second, and more literally, the social construction of nature might denote a humanly produced *material phenomenon*. This material construction applies most obviously to nature in the sense of (iii), even if the term 'construction' is not always the metaphor of choice for describing the ways people materially change the physical environment. Increasingly, through genetic engineering and global environmental change, it is also possible to argue that nature in the senses of (i) and (ii) is also a material social construction. When Marxists use the term 'social nature', it is usually this sense of a socially constructed material phenomenon they have in mind. As Castree (1995: 19–20) explains:

> Capitalism commodifies whole landscapes, constructs and reconstructs them in particular (profit motivated) ways . . . 'first nature' is replaced by an entirely different historical-geography of natural products. The imperatives of capitalism bring all manner of natural environments and concrete labor processes upon them together in an abstract framework of market exchange. Under capitalism humans relate to nature in a specific way, through commodification of natural products, and in so doing actively appropriate, transform, and creatively destroy it. The 'natural' regions of say, the midwestern United States, cannot be understood simply as pre-existent natural grasslands, as the traditional notion of 'first nature' would imply. Instead – and this is the point [of Marxist ideas of social nature] – they must be seen as *constructed natural environments* evolving out of decades of intensive, profit-driven conversion into what they presently are.

Similarly, ANT and some forms of discursive constructionism, particularly those emphasizing hybridity and practice (e.g., Bird, 1987; Butler, 1993), are also making ontological claims about the material social construction of the phenomenon we call 'nature'.

IV   Two points of contention

This distinction between the conceptual and the material social construction of nature is preliminary. Clearly many material constructions of nature will depend on the conceptual constructions that guide the ways people interact with and transform the physical environment, which in turn will influence what people conceive. Thus it can be difficult, in practice, to distinguish between these two ways in which nature is a social construction. Indeed, many proponents of construction-as-philosophical-critique resort to this metaphor for the express purpose of dispelling the subject/object and representation/reality dualisms my simple distinction seems to imply. They would reject any reading that implied their claims about nature were *either* exclusively epistemological/conceptual *or* ontological/material. For them, construction talk is useful precisely because it blurs any sharp distinction between the conceptual and material. Nevertheless this preliminary distinction between the conceptual and material construction of nature is still heuristically useful because it highlights two important points of contention in debates over the social construction of nature.

1   Warranting constructed concepts and knowledge of nature

The first point of contention is epistemological. What are the epistemological implications of acknowledging that our concepts of nature are socially constructed and historically situated? Often, claims about the social construction of specific conceptions of nature are advanced as a way of refuting those concepts and showing them to be false. But the ambiguity of the term construction leaves the epistemological implications of constructionist arguments somewhat unclear. Like most English words with the suffix 'tion', construction is a noun that describes both a process (of constructing) and the outcome of that process (the construction itself). Most people are prepared to acknowledge that our concepts and ideas are humanly created and change over time and space through social processes of discovery, debate and, sometimes, domination. Where there is disagreement is about how these conceptual constructions relate to the world and whether the social processes of constructing them have any bearing on the truth of the resulting knowledge. Does the claim that some concept of nature is socially constructed refute that concept? To what extent does the world 'constrain' our concepts of it, or at least our epistemologically warranted concepts of it? Different formulations of social constructionism imply different answers to these questions.

Construction-as-refutation talk is consistent with a number of conventional philosophical stances. Popper (1969), for instance, believed that scientific knowledge is socially constructed through a continuous process of *Conjectures and refutations*. For Popper, the social commitment to scepticism and the continual testing of belief was what distinguished science from other kinds of belief while the method of empirical falsification guaranteed the credibility, if not (at least for a committed positivist like Popper) the metaphysical truth, of the resulting scientific knowledge. As a first step in falsifying a claim, a positivist might try to show how false belief in it was socially constructed, but demonstrating the latter is not sufficient to establish the former. Just because our knowledge of (X) is socially constructed, historically and geographically situated, and in that sense contingent, does not necessarily mean that it must be false or unworthy of belief. Indeed, the vision of knowledge as conditional and potentially falsifiable was the cornerstone of logical positivism.

Likewise, critical realists also readily acknowledge that our concepts of nature (and of other things) are 'socially constructed' and potentially falsified empirically. However, unlike logical positivists they insist that '[s]ome concepts and theories can be considered verified' and therefore taken as 'reliable "core" forms of knowledge about relations and processes' that are ontologically necessary and whose accurate representation is the epistemological criterion by which 'reliable' knowledge is defined (Dickens, 1996: 73, 76). For critical realists, simply showing the historical process by which some concept is socially constructed disproves neither the concept nor the things to which it refers. Realists acknowledge that construal is one important way that nature is constru(ct)ed, but they insist on upholding 'the difference between the acts of material construction and the acts of construing, interpreting, categorizing or naming' (Sayer, 1997: 468). This ontological distinction is important for critical realists because it provides the foundation for determining the epistemological status of our concepts of nature. To use Plato's gruesome metaphor, valid conceptions 'cut nature at its joints' (Brown, 1994: 125). That is, they correspond to the essential nature, in the sense of (i), of the nature, (i), (ii) or (iii), to which they refer. False ones do not. Such a claim, however,

depends upon being able to find some neutral and non-contingent means of deciding whether our culturally contingent concepts of nature's 'joints' correspond to the 'real' ones to which they refer.

Other varieties of construction talk seek to question the metaphysical grounds for making this judgement. Committed to explaining their research subjects' beliefs in purely social terms, phenomenological constructionism and SSK are sceptical of their subjects' claims that their particular concepts of nature arise from and are warranted by the essential nature (i) of nature (ii, iii). As I have also suggested, however, their scepticism is not always extended reflexively to their own conception of social facts. Their methodological commitment to the symmetry principle and to moral detachment from their research subjects means that they defer from making the kind of epistemic – and political – denunciations involved in construction-as-refutation, which is based on certainty, if not (at least for logical positivists) about how things really are then about how they are not. Most forms of discursive constructionism and ANT are also suspicious of absolute truth claims about 'nature' for both political and philosophical reasons. Politically, the complaint is that such epistemological absolutism involves a failure to acknowledge the effects of power produced by closing off ontological questions about the nature (i) of the nature (ii, iii) to which particular truth claims refer (Haraway, 1991; Escobar, 1996). As a result of such closure, environmental politics becomes a narrowly technical issue of what to do with a pre-given nature, rather than involving wider ontological questions of identity and being. By insisting that the rain forests of the Pacific Northwest are discursive constructions, Braun and Wainwright (2001: 59) seek to open up environmental politics and to demonstrate that 'struggles over nature, land, and meaning are simultaneously struggles over identity and rights' of native peoples, the state, corporate capital and local forestry workers, among others. That political critique depends upon a philosophical one of the metaphysical idea of reference through which particular concepts of nature might be warranted.

Rejecting reference as the ground for truth begs the question of how to decide between competing knowledge claims about nature and the environment. Different varieties of construction-as-philosophical-critique involve different responses to that epistemological and political quandary. Some disavow philosophical foundations for truth altogether. They justify their synthetic statements about the world in terms of the conventionalism of the pragmatist Rorty (1991: 22) for whom the only distinction between valid 'knowledge and opinion is . . . simply the distinction between topics on which agreement is relatively easy to get and topics on which agreement is hard to get' (e.g., Proctor, 1998). Haraway (1991: 187) has proposed the influential idea of 'situated knowledge' as the solution to the apparent contradiction involved with feminists advocating '*simultaneously* an account of the radical historical contingency for all knowledge claims and knowing subjects . . . *and* a no-nonsense commitment to faithful accounts of the real world'. Such situated knowledge is partial, in the sense both of incomplete and of subjectively biased, and yet, Haraway contends, still critical and politically accountable because it is based on the metaphor of intersubjective conversation. ANT as well as some varieties of discursive construction have also invoked metaphors of dialogue, translation and negotiation (e.g., Bird, 1987; Latour, 1999), but it is not clear whether such conversations are seen as legitimating truth claims through Rorty-style consensus or through a hermeneutic fusing of the horizons that is ontologically 'constitutive of what we are in the process of becoming' through the practice of

truly mutual understanding (Bernstein, 1983: 138). Critics complain that, while the intersubjective understanding of hermeneutics might provide an epistemological foundation for warranting claims about other people, metaphors of dialogue are seriously deficient when applied to nature, because nature cannot speak for itself in any 'dialogue' and thus cannot intersubjectively negotiate or contest the validity of representations being made about it. Thus Cronon (1994: 41) suggests that the many proponents of construction-as-philosophical-critique are in fact 'closet realists' because at the end of the day they rely on reference and mimetic correspondence to some external reality as the epistemological criterion for truth. Advocates of the reflexive turn within SSK complain that, all too often, construction talk involves this kind of hypocritical false modesty: in practice, there is often little to distinguish the presentation of the 'situated' knowledge claims of constructionists from the more epistemologically certain claims of positivists and realists. They worry that the frequent resort to naturalistic modes of representation in SSK undermines its radical philosophical agenda (Woolgar, 1988). Haraway's highly stylized prose can hardly be accused of being naturalist in form, but her commitment to 'faithful accounts of the real world' might be read – somewhat uncharitably, I would say, in view of her choice here of a non-visual metaphor – as the sort of epistemological naturalism (common to construction-as-refutation) in which the truth of competing claims can be determined through empirical observation. Another way to read Haraway's account of situated knowledge would be as a conventionalist epistemology consistent with Rorty's anti-foundational pragmatism but more attuned to the effects of power on the conversational search for consensus. In this way, her efforts to acknowledge the agency of the non-human might be seen as a radical attempt to broaden the conversation to include other beings.

2   Ontological contingence

The second point of contention concerns the ontological implications of understanding 'nature' as a socially constructed and therefore ontologically contingent phenomenon. Construction is not always the metaphor of choice for describing the ways people materially shape the physical environment. Nevertheless most people are prepared to acknowledge the material construction of nature in many senses of (iii), though the semantics of the term 'construction' are sometimes a contentious, if trivial, issue. Some Marxists prefer to speak of the production of nature (Castree, 1995). While the semantic difference between production and construction is perhaps useful for signalling a genealogical difference, it does not suggest a substantive one. Both imply a Promethean dominance over an externalized nature, in the sense of (iii). Deep ecologists object to this on moral grounds. They acknowledge that humans physically alter the environment, but condemn these actions of construction/production for an anthropocentric refusal to acknowledge the independent moral standing of nature (iii). Their concern is ethical, as well as metaphysical. Nature (iii) should be regarded as independent and not objectified as a means to human ends.

More controversial is the claim that nature, in the senses of (i) and (ii) as well as of (iii) associated with totality, is a socially constructed and contingent phenomenon. For instance, a great deal of recent research has sought to denaturalize natural hazards by showing that they are in fact socially constructed. In 'taking the naturalness out of

natural disasters', O'Keefe *et al*. (1976: 566) are making two claims. The first is phe-
nomenological: 'Without people there is no disaster.' In response to the age-old
question about the noise made by trees falling in the woods, they would say there is no
'noise' as such – no disaster – without people there to hear it. 'Disaster' is a socially
constructed concept. Not only does its meaning depend on intersubjective claims-
making, but its definition – its nature in the sense of (i) – depends on people having
been affected by the disaster. Unlike many forms of denaturalizing constructionist
critique, O'Keefe *et al*. (1976) do not mean to refute the concept of disaster or to argue
that disasters are not disastrous. Rather they seek to highlight the arbitrariness of what
counts as a natural disaster. Why does the annual death toll from exposure of homeless
people on the streets of New York or other major cities not receive the same attention as
the 1993 floods in the Mississippi Valley, whose media coverage, in turn, generated
much more governmental aid and assistance than the news of yet another flood in
Bangladesh? Thus their phenomenological constructionism has a strong political edge
designed to shock the senses and spur action.

The second claim of O'Keefe *et al*. (1976) concerns the material social construction of
natural disaster: what makes a disaster disastrous is not natural in the sense (iii) of
'extreme physical events'. The subtitle of Garcia's (1981) study of drought and famine
in the Sahel captures this idea nicely: 'Nature pleads not guilty.' O'Keefe *et al*. (1976:
566) insist the 'vulnerability of the [human] population is the real cause of disaster – a
vulnerability that is induced by socio-economic conditions that can be modified by
man, and is not just an act of God.' By emphasizing that both the concept and the
phenomena themselves are socially constructed, O'Keefe *et al*. (1976) insist on the social
contingency of natural disasters. Contingency is important because it suggests that we
have the power to reduce, or even eliminate, the toll from natural disasters. But first we
must recognize we are free to do so.

Though most critics will entertain refutationist claims about the social construction of
particular, ostensibly natural entities, many object to broader claims that nature in
general (i, ii and iii) is socially constructed and contingent. Dunlap and Catton (1994:
23) insist that ' ''deconstructing'' particular representations of environmental problems
does not make those problems any less ''real'' '. For them, 'nature', in all three senses,
is precisely that which is *not* socially contingent. Critical realists believe the role of the
critic is to refute misconceptions of nature and the 'misplaced essentialism' of biologi-
cally reductionist explanations of the social 'without denying natural powers' (i, ii) and
materials (iii) altogether, which would be 'disastrous for emancipatory movements'
(Sayer, 2000: 101, 99, 98). They criticize the 'conceptual poverty' of discursive and other
forms of social constructionism that do not (Soper, 1995: 136–37):

> discriminate properly between those forms of being (bodies, geographical terrain) that are culturally
> transmitted and those kinds of things (telephones, airplanes) that are indeed culturally 'constructed' and have
> a natural existence only in the realist sense that they are constructed out of natural materials . . . Bodies and
> landscape may be said to be culturally formed in the double sense that they are materially moulded and
> transformed by specific cultural practices and in the sense that they are experienced through the mediation of
> cultural discourse and representation. But they are not artefacts of culture and it is no more appropriate to think
> of bodies and sexualities as the 'construct' of cultural practice and discourse than it is to think of the landscape
> as 'constructed' out of agricultural practices or as the discursively constituted effect of Romantic poetry.

Advocates of discursive constructionism might respond to Soper by deconstructing the
very distinction she is making here between socially constructed concepts of nature and

the ontologically essential thing-itself to which they refer. By using 'landscape' to denote the external natural (iii) world itself, Soper ignores the deep duplicity of the term, which spans both sides of the distinction she is trying to make here. Landscape connotes both the affective engagement with scenery through art and the material phenomena that are rendered up to be seen as external through this practice of seeing (Daniels, 1989).

The term 'deconstruction' features frequently in constructionist debates, so it is worth defining more closely. Deconstruction is often used quite loosely to describe any critique of an established claim. For instance, Dunlap and Catton (1994) and Schneider (2001) both use deconstruction as synonymous with refutation. But the term also has a precise technical meaning closely associated with the poststructuralist French philosopher Jacques Derrida (Barnett, 1999). As practised by Derrida, deconstruction is a method of reading designed to destabilize the truth claims of a text by undermining the logic of hierarchical oppositions structuring a text and giving it meaning. Since some essentialist assumptions are the necessary starting-point for any positive knowledge of the world, there has been some debate about whether poststructural deconstruction amounts to a philosophical world-view in itself or is merely a tool for criticizing the metaphysical assumptions of other world-views.

Considering the way in which all the various meanings of the term 'nature' are defined through hierarchical oppositions to senses of the cultural, artificial, or human, concepts of nature are ripe for technical deconstruction. So too is the distinction I made previously between the conceptual and material social construction of nature. For this reason, many poststructurally inclined advocates of discursive constructionism resist it, as do proponents of ANT. They would insist that this distinction – like nature itself – is at root discursively constructed and contingent. For instance, Haraway (1992: 296) calls nature a 'trope' in that its figuration always depends on certain metaphysical pre-sumptions that must be taken on faith to provide the organizing foundations for discerning knowledge, meaning, truth and existence. Because these foundations can always be deconstructed, any particular construction of 'nature', either conceptual *or* material, must, for poststructuralists, remain contingent.

But contingent in what sense? The rhetoric of social contingency tends to reinscribe the nature/society dualism in the form of an opposition between necessity and contingence. These are very old dualisms in social theory. The reappearance of the nature-society dualism in the form of an opposition of contingency and necessity suggests both how deeply ingrained the nature-society dualism is in our habits of thought and how difficult it will be even for avowedly poststructural critics to transcend them completely.

Haraway's highly figurative prose style makes her position rather elusive. In a way that is precisely her point, but it also makes her claims frustratingly difficult to understand and evaluate. In her influential 'cyborg manifesto' Haraway (1991: 181) calls for feminists to reject 'universal, totalizing theory [as] a major mistake that misses most of reality, probably always, but certainly now'. In place of the essentialist metaphysics of pristine nature and absolute knowledge of it, she calls for progressive critics to embrace the bastardized image of the cyborg, 'a hybrid of machine and organism, a creature of social reality as well as a creature of fiction' (p. 149). That claim seems to involve strong ontological claims about the hybrid structure of the world, as does her declaration that the cyborg is 'our ontology' in a new world order of

'transgressed boundaries in which distinctions between nature and society, human and animal, machine and organism, and between fact and fiction are no longer so certain or secure' (p. 154). In other places, however, her usage suggests that the cyborg is not being offered propositionally as a synthetic statement whose accuracy might be evaluated empirically but as a way of being-in-the-world 'in partial connection with others' that might provide 'a way out of the maze of dualisms in which we have explained our bodies and our tools to ourselves' (p. 181). The speed with which discursive construc- tionism, ANT and the rhetoric of hybridity have swept through the discipline of geography suggests how widely shared is her desire to transcend dualistic thinking about nature. However, as Latour (1993: 55) notes of dialectics, the idea of mixture can also work to reinscribe the dualisms at issue.

Constructionist claims about the construction of nature are often ontologically ambivalent. For instance, Braun and Wainwright (2001: 56) declare that 'poststructural- ist thinking attunes us to the contingency of what comes to count as the "real".' The scare quotes signal some of the ambivalence of their claim. Not wishing to 'deny the materiality of the world' (p. 45), they also 'insist that there is no way to talk about this ''reality'' . . . without words and concepts'. Thus they express their scepticism about the distinction I have made between the conceptual and material construction of nature and the clean separation of ontology from epistemology it implies. Instead they seek to emphasize how 'what counts as nature is never a closed question' (p. 41). However, this scepticism is subverted somewhat by the problematic distinction implicit in their usage of 'nature' to designate culturally contingent *concepts* of nature and 'social nature' to designate the material referent of those concepts. Their emphasis on intelligibility would suggest that for them discursive construction amounts to a nominalist claim about concepts as constructions with no necessary relationship to the class of objects they designate. Indeed, their approach 'forces us to recognize the fundamental openness, or undecidability, of what counts as nature in environmental conflicts and . . . the urgent need for critical analysis of how the stabilization or normalization of any particular understanding of nature is achieved' (p. 42). But this epistemological nominalism sits somewhat uneasily with the strong empirical claims that they then go on to make about the 'constitutive absences' and exclusions through which the rain forests of British Columbia were constructed both conceptually and materially. Advocates of reflexivity in SSK might well complain that such sceptical nominalism about *other* people's conceptual framing of the forest does not go far enough in acknowledging the rhetoric involved in constructing one's own account. By contrast, Sayer (2000: 92) complains that 'use of the hopelessly misleading metaphor of con- struction invites idealist slippage for it evades the question of the relationship of our social constructions to the nature of their referents'. It suggests that nature is ontologi- cally contingent upon either the particular way that it is subjectively constru(ct)ed by individuals or upon other social processes that are independent of the researcher but nevertheless social in origin. 'Instead of illuminating the relationship between the biological and the social, social constructionism merely inverts biological reductionism, so that what is both social and within the bounds of nature in the realist sense is treated as a convention having nothing to do with nature' (Sayer, 2000: 101).

V   Conclusion

In this essay I have tried to clarify the meaning of claims about the social construction of nature. My effort stems from a growing sense of frustration with these debates. Understanding the 'social construction of nature' is important because it can help us acknowledge the power of humans to shape nature both through our concepts and through the material practices that lead to and follow from those ways of constru(ct)ing nature. Unfortunately, the sharpness of the construction metaphor and of the theoretical insights it can provide is becoming dull from overuse. Geographers have invoked the 'social construction of nature' both to refute particular claims about the world and to make a variety of philosophical critiques of conventional understandings of nature and society. There is value in both these general aims, but they may be incommensurable. Despite the self-styled radicalism of construction talk, I have shown that the first kind of construction-as-refutation is actually quite traditional. It upholds conventional distinctions between culture/nature, subject/object and representation/reality that provide the philosophical foundations for distinguishing true conceptions of nature from false ones. By contrast, I identified four other broad sorts of construction-as-philo-sophical-critique that use the construction metaphor to challenge those dualisms.

In so doing, I identified two related but distinct points of contention in debates about the social construction of nature, which might both be better elucidated through greater terminological precision. The first concerns the epistemological implications of under-standing our concepts of nature as socially constructed, historically and geographically situated, and in that sense contingent. I pointed out that, in so far as all concepts are constructed, the construction metaphor may not be the most effective way to refute taken-for-granted beliefs about particular things. In light of the metaphysical baggage the term carries, refutationists would do better to dispense with it altogether and simply call misconceptions of nature wrong. A second major point of contention concerns the metaphysical implications of understanding 'nature' as a socially constructed and ontologically contingent phenomenon. For many critics of construc-tionism, 'nature' is precisely that which is *not* socially contingent, but the 'social con-struction of nature' is used in so many ways that it is not always clear what is meant by the term. Some use it in a nominalist vein to denaturalize 'nature' as always conceptu-ally and discursively mediated, others in a more literal, ontologically idealist way to suggest that natural phenomena are literally built by people, while yet others use the construction metaphor to explore the ways that the matter of nature is realized discur-sively or through networks of practical engagements with heterogeneous other beings. These different understandings of the who, what and how of nature's construction turn largely on the relationships between the process of conceptual construal and of materially constructing, but unfortunately use of the noun 'construction' obscures the relationships at issue between the process and the outcome of construction. Arguments regarding the social construction of nature could be made more precise and more convincing by using the verb 'construct' and focusing on processes of constructing, instead of the noun 'construction' and the outcome of those processes.

There are important issues at stake in debates over the construction of nature, both political and philosophical. So much of the discussion, particularly among self-styled critical geographers, has emphasized its political implications that we may have lost sight of its philosophical ones. Arguments about the construction of nature are

ambiguous because of the slipperiness of both terms. As a result, constructionists and their critics tend to talk past each other rather than engaging productively with points of substantive disagreement. I have tried to clarify that ambiguity by defining those terms more closely. The variety of constructionisms suggests that it is possible to understand the social construction of nature in a number of different ways, but unless people are more careful with their terms the world-views implied by claims about the social construction of nature will be no clearer than the politics.

Notes

1.   My count does not include the countless references in the CD-ROM volume of abstracts to the social construction of other things, such as dams or identities, the more literal reference of physical geographers to their palaeoenvironmental reconstructions, or to the construction industry.

2.   Such debates are by no means restricted to the discipline of geography. Arguments about the social construction of nature have sparked similar rancour within environmental history, sociology and anthropology (Brosius, 1999; Burningham and Cooper, 1999; Demeritt, 1994; Escobar, 1999; Hannigan, 1995; Irwin, 2001).

3.   That is not to say that SSK was not political in either its intentions or effects. Its rise is perhaps best understood as a critical response to 'physics envy' and the imperial claims made within the social sciences about the scientific method.

4.   Ironically, Latour's actor-network approach has also been criticized by some science studies scholars as thinly disguised 'neo-realism' that lets an autonomous nature back into properly social explanations of scientific phenomena and beliefs (Collins and Yearley, 1992).

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