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Cultural ecology: adaptation – retrofitting a concept?

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Abstract: Adaptation was a core concept of twentieth-century cultural ecology. It is having a new life in the context of debates over climate change, particularly as it becomes more significant in public discourse and policy. In this third and final progress report, I identify ways in which geographers and others are currently using the concept of adaptation, tracing both continuities and discontinuities with its earlier heritage. Three differences that warrant attention are the new mitigation/adaptation binary, the deliberate and conscious nature of climate change adaptation, and the fact that the stimuli to which we are adapting are complex assemblages comprising more-than-climate. To 'retrofit' the concept for twenty-first-century conditions, we should avoid the limitations of some past uses, and enhance its operation with new techniques and approaches. I identify four threads in recent geographic research that enhance the retrofit: cultural research around climate; emphasis on everyday practices; attention to the contingencies of scale; and more-than-human/more-than-nature theoretical conceptualizations.

Key words: adaptation, climate change, culture, mitigation, more-than-climate, vulnerability.

I Adapt now!

'Adapt now!' is the first of nine lessons summarizing the outcome of a major recent study into climate change adaptation (Leary *et al*., 2008). The urgency, sense of purpose and deliberateness in this injunction sit uneasily with the notion of adaptation in longer-term histories of cultural evolution. Is this the same sort of adaptation, we wonder, that gave us the right sort of dentition to eat plants with underground storage organs (Laden and Wrangham, 2005), or led to the survival of grandmothers (O'Connell *et al*., 1999; Alvard, 2003; Bird and O'Connell, 2006)? With wide recognition that a significant amount of anthropogenic climate change is already locked into global systems, and that this will interact dynamically with underlying socio-ecological problems, it is increasingly acknowledged that adaptation is as important as mitigation (Smit *et al*., 2000; Adger *et al*., 2005; Pielke *et al*., 2007). Geographers involved in the Intergovernmental Panel on Climate Change (IPCC) process have called for more, and more systematic, adaptation research (Liverman, 2008a). What sort of research will and should this be? What understandings and practices of adaptation

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are circulating as departments, think tanks, plans, policies, frameworks and strategies multiply?

Dovers (2009: 4) argues that 'coherent discussion of the theory and practice of [climate change] adaptation is quite recent'. Those who debated adaptation as a core concept of cultural ecology through the middle to late decades of the twentieth century might beg to disagree. In this third and final progress report, I identify ways in which geographers and others are currently using the concept of adaptation, and trace both continuities and discontinuities with its earlier heritage. To 'retrofit' the concept for twenty-first-century conditions, we should avoid the limitations of some past uses, and enhance its operation with new techniques and approaches. In the concluding section I suggest some implications for ongoing research.

II The twentieth-century model

In practice, adaptation has long been a slippery concept with a variety of applications. It invokes change along a continuum between general 'flexibility' and quite specific reconfigurations of genetic material. Adaptation in cultural ecology was an extension of its use in evolutionary biology, and refers to the process by which individuals adjusted to their surroundings. In regard to human societies, scholars typically distinguished between biological (genetic, physiological, skeletal) and cultural adaptation. The latter involved not just (and sometimes not even) the individual, but the broader cultural group or community. Thus migrant groups were studied, as groups, as they adapted to new environments (eg, Mannion, 1974). The term 'adaptive strategy' was also used for the system of economic production (Cohen, 1974), as in hunter-gatherer adaptive strategies. In this way a concept of culture developed that encompassed both 'adaptive strategies employed by people living in particular conditions and … systems of meaning to which humans must also adapt' (Keyes, 1977: 9).

Several tensions relevant to today were present in earlier discussions. Working in a climate influenced by systems theory and by broader structures of explanation-seeking generalizability, Brookfield (1973: 5) wrote that he felt obliged to avoid the 'sin of particularism' but was unable to. This was connected to the role of the individual *vis-à-vis* the broader society (Edgerton, 1971). What was the relevant unit of analysis? The broader context here was an assumption that so-called primitive peoples, the focus of so much adaptation work in cultural ecology, had fixed cultures. Further, the term adaptation contains within it a sense of change and movement, so how were scholars to deal with apparent lack of change? The matching concept of 'maladaptation' was used, often connected to conservative patterns of behaviour in peasant and tribal societies. 'We find we have to deal with behaviour that by "objective" standards seems irrational' (Brookfield, 1973: 9).

Although cultural was distinguished from biological adaptation, it retained a biological legacy. More specifically, it retained a mid-century systems perspective on biology and ecology. This, argued Watts (1983), had two particular implications. First, people and nature were 'seen as discrete entities – culture and environment – in which the latter is seen as limiting, non-dynamic and generally stable' (p. 235). This leads to a 'billiard ball' view of the world (p. 235) in which pre-constituted entities interact. Second, such interaction is understood in neo-Darwinian terms to discuss human adaptation, ie, the maintenance of homeostasis is the assumed outcome. Society is understood as 'a type of self-regulating, self-organizing living system isomorphic with nature itself' (p. 237); its 'goal is nothing more than survival' (p. 236). Watts argued instead for an approach that understood human adaptation as 'the appropriation and transformation of nature into material means of social reproduction. This process is both social and cultural and it reflects the relationships to and participation

in the production process' (p. 242). Rather than assuming cybernetic regulation within social systems, this approach recognizes that they are 'accumulative, contradictory and unstable' (p. 239).

Many things have changed since Watts' critique. The emerging 'new ecology' criticized the homeostatic view within ecology itself, as it became increasingly clear that the assumption of stability within nature was flawed. More dynamic understandings of adaptation have emerged to match. For example, 'adaptive management' is understood as a capacity to change, be flexible and respond quickly to surprise and difference (Folke *et al*., 2005). Contingency is everywhere (Simmons, 2006). A much more dynamic view of culture emerged from the cultural turn of the 1980s and 1990s, and more has been written on the social production of nature than anyone has been able to read, decisively smashing the billiard balls and reconstituting them in new relationships. Where adaptation has currency for geographers as a concept outside climate change, for example in hazards research, the tendency is no longer to use it in bluntly functionalist ways, and it is linked with concepts like risk, resilience and vulnerability.

Perhaps I am unduly nervous that we could easily find ourselves back in the 1950s. However, I argue here that there is a risk of discredited dualisms becoming re-embedded in patterns of thinking and proposed solutions to problems. Recognition of anthropogenic climate change through the last decades of the twentieth century was in many ways the final nail in the coffin of environmental determinism. It was also another demonstration that, if humans and their activities are embedded in the very structure of the atmosphere, we needed new ways of thinking about things. It will be a tragic irony in more ways than one if we now talk about adaptation in ways that simply reproduce earlier deterministic models, albeit the billiard ball knocking us around is partly of our own making.

III Climate change – how is adaptation different in these debates?

The IPCC defines adaptation as 'the adjustment in natural or human systems in response to actual or expected climatic stimuli or their effects, which moderates harm or exploits beneficial opportunities' (Parry *et al*., 2007: 6). Apart from its focus on climate as the relevant stimulus, this definition has much in common with earlier uses in cultural ecology. Here I identify three differences that warrant attention.

1 The mitigation/adaptation binary

It is arguable whether the climate change debate has gone beyond the nature/culture binary, but it has certainly created a new one, that of mitigation/adaptation. (Mitigation is defined as 'technological change and substitution that reduce resource inputs and emission per unit of output' of greenhouse gases; IPCC, 2007: 84.) This separation is embodied in the allocations to working groups of the IPCC (mitigation to working group III, adaptation to working group II). Geographers have been involved since early in the process, including Barnett (2001) who noted then a reluctance by the IPCC to define adaptation. Adaptation came late to the Kyoto Protocol negotiations (Grist, 2008), partly because 'the uncertainties of the science until that point [2001] meant that inevitable climate impacts were not known in sufficient detail to provide a basis for policy creation' (Grist, 2008: 791). Early papers such as Barnett (2001) were framed very much in how to create policy for uncertainty. Others have argued that adaptation was the junior partner, allowed late to the discussion, because to do so would seem defeatist (Pielke *et al*., 2007; Biesbroek *et al*., 2009).

An emerging body of work examines the history of the dichotomy and its institutionalization (Füssel and Klein, 2006; Schipper, 2007; Larsen and Gunnarsson-Östling, 2009; Biesbroek *et al*., 2009). Füssel and Klein argue that the conceptual thinking around adaptation has changed and continues to do

so, moving from simple 'impact assessments' that 'superimpose future climate scenarios on an otherwise constant world' (p. 324) through vulnerability assessments that pay more attention to the 'adaptive capacity' of societies, determined by non-climatic factors such as economic resources, skills and institutions, and incorporate the idea of resilience.

The nature/culture binary is tending to reinforce others; mitigation is seen as a top-down process for national governments and the international community, while adaptation is bottom-up for individuals and local communities (Garnaut, 2008). Mitigation is long term, adaptation is short term. Important work is now identifying both synergies and potential conflicts between the two (Liverman, 2008a; Pizarro, 2009). In their study of land-use plans and policies designed to address climate change, Hamin and Gurran (2009) found that in a sample of 50, 22 had potential conflicts between mitigation and adaptation. For example, densification of urban areas to reduce car use (mitigation) conflicts with provision of additional open space to enable water inundation in extreme events (adaptation).

2 Adaptation as a deliberate and conscious process

There is no place in the climate change policy debate for accidental adaptation, unless we fail to take appropriate action and thus become maladapted in the long run. This is a process that is deliberate and requires conscious and explicit policy responses (Schipper, 2007). 'We can adapt to climate change and limit the harm, or we can fail to adapt and risk much more severe consequences' (Leary *et al*., 2008: 1).

Related to this is the test of our faith in science as a means of prediction and dealing with uncertainty. As 'Adapt now!' suggests, we need to do it before we can see it. We have to trust scientists and their predictions.

3 What is the stimulus?

Although the IPCC definition talks of climatic stimuli, the process that will stimulate conscious adaptation is a complex assemblage incorporating many elements in addition to climatic ones. We are responding to the stimuli of science, policy-makers, media and fear, rather than (or at least in addition to) climate itself. As the recent tragic bushfires in southeastern Australia illustrate, even in extreme events where there is probably a climatic element of a new and altered normality, the adaptation assemblage includes underlying socio-economic conditions and changing patterns of land use. A public discourse framed around the binary of 'was it climate change or not?' is not only poorly conceived, but unnecessarily distressing at a time when social collaboration is at a premium.

IV The retrofit – four aspects

The flexibility and accessibility of the adaptation concept has already given it a place in the international policy arena and in more local public imaginations. This will only increase in coming years. What contributions can geographers influenced by the cultural ecology tradition make, and what are the best ways in which to retrofit the concept?

1 Cultures of climate

With research efforts having hitherto focused on establishing the science behind climate change, it is now well recognized that the problems require social and cultural as well as scientific solutions. Scientific leaders themselves now frequently call for a 'culture change' in our environmental positioning. It is important for geographers and others to mobilize more dynamic understandings of culture developed over the last two decades in these debates. For example, it is necessary to forestall framings that envisage too straightforward a link between public education and behavioural change.

As Lorenzoni *et al*. (2007) demonstrate, increasing knowledge does not necessarily result in changed behaviour. The necessary cultural changes will be extremely complex and occur at the intersection of individual, social and institutional behaviours and attitudes.

We should first accept a mandate to maintain cultural analyses of the concept of adaptation, the assumptions embedded in its usage, and the slippage of its application (see also Füssel, 2007, on vulnerability). There will be room for more than one history of the idea, in the vein of Takacs (1996) for biodiversity. The importance of analysing the public discourse has been well illustrated by the work of Demeritt (2001a; 2001b; in debate with Schneider, 2001; see also Carvalho, 2007). Liverman's (2008b) exploration of three narratives provides a recent exemplar that has additional power because the author has been embedded in the political/scientific process of the IPCC (Liverman, 2008a).

> I would argue that the stories of dangerous climate change conveyed in these powerful images of 'burning embers' and 'tipping points' are predominantly biophysical, with human systems and geographies relatively unexplored or obscured. As in the earlier days of climate impact assessment the approach tends towards an environmental determinism driven by climate science and lacks a nuanced analysis of vulnerability and the distribution of risks and capacity to adapt to them. (Liverman, 2008b: 9–10)

Such despatches from different types of front line (see also Adger *et al*., 2009) should become increasingly important. Self-reflexivity among geographers working in the adaptation field will maintain a healthy critique from within, while making practical contributions.

The broader importance of cultural analysis in climate change debate has been highlighted by Hulme (2008). A refreshing diversity of research projects is emerging (Boykoff, 2007; 2008; Gorman-Murray, 2008; McCormack, 2008; Boykoff and Goodman, 2009; McNamara and Gibson, 2009), informed by two decades of cultural turn in geography and elsewhere. Pollard *et al*.'s (2008) work on weather derivatives is particularly fascinating, partly for the potential conversations the topic enhances between human and physical geographers. Other areas of the humanities are also actively researching cultures of climate (Sherratt *et al*., 2005; Potter and Star, 2006; Orlove *et al*., 2008).

As in other fields where engagement with indigenous approaches profoundly reorients the original question, attempts to take seriously indigenous knowledges in studies of climate change adaptation and vulnerability/resilience have in fact to deal with challenges to the terms of the debate (Leduc, 2006). In this case indigenous knowledge may challenge the idea that climate change is a problem that we can and must 'do something about'. There will be important cultural differences in the extent of fatalism about the future that need analysis – both within and between different community groups.

2 Attention to everyday practices

Methodologically, attention to everyday practices using ethnographic and related methods is a long-standing attribute of adaptation studies in cultural ecology, mostly in rural and developing contexts. Social dimensions of adaptation have received most attention in relation to the developing world, where communities and nations are recognized to be particularly vulnerable (Adger, 2003; Ziervogel *et al*., 2006; Osbahr *et al*., 2008; Mortreux and Barnett, 2009), and also in relation to indigenous people (eg, Berkes and Jolly, 2001; Nyong *et al*., 2007; Ford *et al*., 2008).

Relatively wealthy well-educated countries are often assumed to have strong adaptive capacity (Brooks and Kelly, 2005), leading to a focus on technological dimensions of adaptation, such as agronomic changes in

the case of agriculture. The retrofit not only brings developed urban societies under the research umbrella (eg, O'Brien *et al*., 2006, for Norway), but also connects behaviour more systematically with technological change, for example in the work of Shove (2003) and Hobson (2006). This will probably mean drawing on research methods and approaches that have been more commonly used in the developing world (eg, participatory approaches; Kelkar *et al*., 2008). It will also mean more attention to the household scale of analysis (Thornton *et al*., 2009).

Other useful connections have been made with psychological assessments of risk behaviour (Grothmann and Patt, 2005), and analysis of the strengths of belief in climate change (Blennow and Persson, 2009).

Assumptions about adaptive capacity are being challenged. Many parts of the developing world have great resilience and adaptive capacity (Berkes and Jolly, 2001; Coulthard, 2008), and well-established institutions may lack the flexibility to respond quickly. Further, diversity in vulnerability and resilience is increasingly recognized within broader social categories as well as between them (eg, Acosta-Michlik *et al.*, 2008). Adger *et al.* (2009) explore the interaction of ethics, knowledge, risk and culture in constructing the social limits to adaptation.

3 Scale in space and time

Adaptation is an area demanding critical attention to questions of scale (Adger *et al*., 2005; Pelling *et al*., 2008), and Slocum (2004) has drawn attention to important connections between scale and everyday practice. It is important that the valorization of the local and the individual in some adaptation policies does not go unexamined. As discussed above, the mitigation/adaptation binary can tend to entrench a simplistic view of adaptation as a localized and individualized process, with insufficient attention given to questions of power and scaling up. There are productive connections to be forged here with discussion about the neoliberalization of nature (Castree, 2008a; 2008b). Castree (2008a) identifies scale-crossing and scale-jumping as one of the distinctive strengths of recent geographic studies of the neoliberalization of nature.

More dynamic and relational approaches to temporal scale will also be needed, in part to contest a neat divide between 'climate change' time and 'now' or 'before' (depending on whether you think we are there yet). Leary *et al.* (2008) provide an example of such (inadvertent?) delineation:

> The implication is that current practices, processes, systems and infrastructure that are more or less adapted to the present climate will become increasingly inappropriate and maladapted as the climate changes. Fine tuning current strategies to reduce risks from historically observed climate hazards will not be sufficient in this dynamically changing environment. More fundamental adjustments will be needed. (Leary *et al*., 2008: 8)

Consideration of temporal scale questions will be of more than academic significance. For example, Dovers, while acknowledging that there will be a set of climate changes 'beyond human experience and institutional memory' (2009: 4), is also anxious that we do not try to reinvent the wheel by failing to acknowledge adaptive capacities built into existing environmental management systems.

4 More-than-human approaches go with the new ecology

A number of geographers have identified synergies between 'new ecology', contingency in long-term environmental change, and relational 'more-than-human' geographies, that have relevance to rethinking adaptation. For example, most recently Gandy writes:

> The shift in emphasis from cyclical to historical (non-cyclical) conceptions of time in combination with relational rather than fixed conceptions of scale suggest a degree of conceptual convergence between the latest insights in ecological science and a variety of developments within human geography and cognate disciplines including an emphasis on

> non-hierarchical patterns of spatial difference, extended conceptions of agency and a wide-ranging engagement with new philosophies of social and spatial complexity. (Gandy, 2008: 563)

This emphasis on relationality chimes with arguments that adaptation studies have not fully considered how climate interacts with other drivers (Thomas *et al.*, 2007; Liverman, 2008a; 2008b; Wei *et al.*, 2009), and that some are therefore the equivalent of earlier environmentally deterministic views of adaptation (Liverman, 2008a: 5). The complexity of climate change debates, and the intractability of the geopolitical issues entwined with them, can tend to enhance simple metaphors. Adaptation is an attractive concept in this regard. Yet, if geographers can resist the urge to holism, there is a possibly stronger contribution we can make:

> the 'new ecology' makes much more modest scientific claims than the systems-based approaches of the past and hence its potential contribution to public policy is of necessity different in its scope but arguably more accurate, realistic and epistemologically nuanced, including a fuller recognition of the role of different forms of technical expertise within political discourse. (Gandy, 2008: 563)

Significant practitioners of the new ecology not only recognize the importance of social and cultural history (Hobbs, 2008) but extend the heterogeneity to the solutions themselves: 'if rapid environmental change is to become the norm, having an array of different approaches may be the best way of building resilience into both our management and the ecosystems themselves' (Hobbs, 2008: 8).

Adaptation looks set to be around in public discourse for the foreseeable future. The kind of geographic labour discussed in this section is starting to retrofit it for that future in very useful ways. Vigilant attention to discourses and practices of power will continue to be important, as will critical attention to questions of scale. Methodologies that engage with diversity in everyday practices expose vernacular capacities as well as vulnerabilities. Theoretical frameworks that explore the relationality of ecologies, technologies, bodies and socialities will be vital. As increasing numbers of geographers become active in adaptation policy, ethnographic reflection on our own involvement will serve us well.

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