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**Cities, social cohesion and the environment:
Towards a future research agenda**

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Abstract

It will be argued in this paper that the problematic of social cohesion is also one of socio-ecological cohesion whereby the urbanisation of nature and its socio-environmentally enabling and disabling conditions are key processes. By viewing the contradictions of the urbanisation process as intrinsically socio-ecological ones, the terrain of social cohesion is shifted both epistemologically and politically. The paper critically examines three contemporary schools of thought that consider in different ways the relationship between cities, social cohesion and the environment. It begins with a critical examination of the notion of urban sustainability. The paper will then move on to consider two approaches that emphasise issues of (in)equality and (in)justice in the urban environment, those of environmental justice and urban political ecology. The final part of the paper pinpoints four areas of research that urban researchers must examine if we are to understand more fully—and act more politically on—the nexus between cities, social cohesion and the environment.

Introduction

The question of how cities can accommodate the environment or how more cohesive socio-environmental urban environments can be planned, built and managed has challenged academics, activists and policymakers alike for centuries. From the mid 19th century onwards, the concern for many was with utilising the

environment as a tool to improve living conditions in the city. Engineers sought to bring clean water, air, light and sanitation into the houses of most urban dwellers in the global North and, by doing so, contribute to the production of healthy and socially more just living in a cohesive city (Kaika and Swyngedouw, 2000). Planners, architects and urban designers, meanwhile, drew upon the ideas of Frederick Law Olmsted, Le Corbusier and Frank Lloyd Wright, among others, who emphasised the need for the integration of ‘nature’ in the city, a gesture that would restore social harmony and achieve ‘wholesome’ living (see Fishman, 1982). Fast forward to today and the rhetoric of sustainability and sustainable cities is all around us, being discussed in town halls, environmental activist meetings, public demonstrations, the day-to-day conversations of citizens and, of course, at the various governmental, academic and activist conferences. Although there are different emphases in the sustainability discourses from their antecedents, the focus remains on how to align cities and city living with the constraints, possibilities and possible limits of the earth’s physical environment.

While it would not be uncontroversial to argue that there are fundamental links between cities and the environment, the relationship between urban change, the environment and social cohesion—as this paper will intend to show—may be more contentious. What, you may ask, has social cohesion, the theme of this Special Issue, got to do with the environment? If we take social cohesion to incorporate issues of social (in)justice and (in)equality, we can begin to see that

the environment, just as the other 'arenas' examined in this Special Issue, is wrapped up in fundamentally uneven, unequal and often downright unjust social relations. As this paper will show, not only is there a distinctive lack of social cohesiveness in societal relations with the urban environment in terms of access to healthy environments and environmental decision-making structures, for instance, but socio-environmental inequalities are also a fundamental part of the urbanisation process. If the tension between the apparently opposite aspirations of belonging and differentiation galvanises the urban cohesion debate, socio-environmental processes are inextricably related in this dialectical dynamic. From this perspective, the nexus between social cohesion, the environment and cities is a vitally important issue. More importantly perhaps, as the introductory paper to this Special Issue explores, 'social cohesion' should be thought of as a political *problématique* of which ecological concerns are an integral part. We shall focus here on the dialectic between socio-ecological transformation as a necessary process that undergirds urbanisation on the one hand and the socio-ecological condition of cities on the other. In other words, the problematic of social cohesion for us is one of socio-ecological cohesion whereby the urbanisation of nature and its socio-environmentally enabling and disabling conditions are key processes. Rather than considering the role of nature in the city, we are concerned with analysing how the urbanisation of nature shapes socio-ecological relations. By doing so, the terrain of social cohesion is shifted both

epistemologically and politically from considering the domains of nature and the city as separate, yet intertwined, to viewing the contradictions of the urbanisation process as intrinsically socio-ecological ones.

This paper, therefore, will critically examine three contemporary schools of thought that consider in different ways the relationship between cities, social cohesion and the environment. It will be necessarily selective in scope and, although the paper's empirical focus will be on European towns and cities, it will place emphasis on how European cities are connected to ideas, activist networks and global production networks that stretch beyond the city and the continent.

The paper will begin by examining the notion of urban sustainability, arguing that despite its popularity it is inherently flawed through its technocracism, its foundational view of the nature of nature and disavowal of questions of social (in)equality and (in)justice. The paper will then move on to consider two more sophisticated approaches that emphasise issues of (in)equality and (in)justice in the urban environment, those of environmental justice and urban political ecology. The final part of the paper pinpoints four areas of research that urban researchers must examine if we are to understand more fully—and act more politically on—the nexus between cities, social cohesion and the environment.

Urban Sustainability and Beyond

Since the late 20th century, the notions of sustainability and ecological resilience have become increasingly hegemonic in European cities. So much so that if a policy-maker was to talk about the environment and the city, he or she would almost certainly use the phrase sustainability or a variation of it. Its mainstreaming has been marked by a number of emblematic moments such as the publication of accounts that showed that the socio-ecological ‘footprint’ of cities was indeed truly global (Girardet, 1992, 1999; World Commission for Environment and Development, 1987) and a number of ‘global’ meetings such as the 1992 Rio Earth Summit and the recent United Nations Climate Change conference in Copenhagen, Cancun and Durban. Much lip-service has been paid to the United Nation’s World Commission for Environment and Development (1987) report *Our Common Future* (widely known as the Brundtland Report). Three of its core messages are often repeated by urban policy-makers and practitioners throughout the world: first, its belief that we should “adopt life-styles within the planet’s ecological means” (p.9); secondly, its definition of sustainable development as “development that meets the needs of the present without compromising the ability of future generations to meet their own needs” (p.5); and, perhaps most importantly, the necessity to make economic development, social justice and the environment—the three pillars of sustainability—work together rather than in opposition.

The Brundtland Report, of course, feeds into the wider ideas around urban sustainability which point to the current unsustainability of cities and the urgent need to retrofit or re-organise them such that a more 'sustainable' form of urbanisation can be produced. Cities, it is widely highlighted, produce untold amounts of toxic pollution and greenhouse gases, they consume nonrenewable fossil fuels such as oil and gas in vast quantities, and they burn and dump much of their waste (Blowers and Pain, 1999). Such assessments are also associated with the post-socialist cities of central and eastern Europe which have suffered not only from severe environmental problems associated with hyperindustrialisation, socialist urbanisation and the political restrictions on environmental movements during the state socialist era, but also from insufficient post-socialist environmental protection legislation (see, for instance, Pavlínek and Pickles, 2000; Whitehead, 2005, 2007). Added to the view that cities are seen as being unsustainable, urbanisation across Europe and beyond is increasingly viewed as having an often unrepentant damaging effect on ecologies elsewhere. In the quest to "make the unsustainable sustainable" (Whitehead, 2007, p. 13), a whole series of urban blueprints and best practice guides and models—from Malmö's 'sustainable' waterfront development to Freiburg's use of green technologies—have been mobilised and commodified (see Whitehead, 2007; Farr, 2008; Hopkins, 2008), while a range of industries have developed in monitoring sustainability indicators, 'fixing' unsustainable technologies and retrofitting urban

infrastructure, and marketing and selling 'sustainable' products from food to computers, bags to energy (Astleithner *et al.*, 2004). In short, there is a lot of money to be made in making things sustainable through tactics and strategies of ecological modernisation.

Although it does pay more attention to the extra-local impacts of the (un)sustainable city, the sustainability argument and practices are sutured by a fantasy of socio-ecological cohesion which can be achieved by means of the mobilisation of a combination of ecologically sensitive technologies, good managerial governance principles, appropriate institutionalised modes of stakeholder-based participatory negotiations, changing consumer cultures and individual habits. These technological fixes are supported by, and supporting, hegemonically accepted growth-oriented neo-liberal market mechanisms as the idealised delivery mechanism. There is an unending stream of literatures that regurgitate this argument *ad infinitum* (da Cunha *et al.*, 2005). This also holds true for recent and apparently more sophisticated approaches that rely on complexity and complex adaptive systems perspectives. If the sustainability discourse emerged as part of the discourse of modernity (with its belief in certainty, optimisation etc.), the urban resilience and complexity argument is linked to the emergent interest in complexity, uncertainty, emergence, non-linearity and probabilistic explanation (Levin, 1998; Alberti and Marzluff, 2004; Pickett *et al.*, 2004). Whereas sustainability inherited from modernity the idea of certainty,

urban resilience and adaptation perspectives inherited from complexity science the idea of ‘true uncertainty’—i.e. that collective actors (even the likes of managers, experts and scientists) can never be certain of the future. In other words, socio-ecological properties are not ‘determined’, but ‘emergent’ (Murgerauer, 2010). This has led to a reconsideration of the principles and practices of natural resource management. Instead of focus on ‘command-and-control’, urban resilience and adaptation focus on the ‘navigation’ of socio-ecological systems through continuous monitoring of and learning from certain environmental variables (Ernstson *et al.*, 2010). These forms of resilient management envisage change through voluntaristic ‘management’ and economic valuation of ‘ecosystem services’ (Norgaard, 2010).

Although emphases and orientations vary, both sustainability and resilience perspectives are ultimately concerned with what can be done within an urban sociopolitical order that is considered given. The techno-managerial discourses and practices that infuse and shape sustainability policies circulate around a particular notion of what nature is and how nature should be managed on the one hand while evacuating proper dissensual democratic political arguments from the terrain of policy intermediation. Hence, the marker of ‘sustainability’ signals a depoliticising gesture that further re-enforces the sedimentation of post-political frameworks and configurations (see Swyngedouw, 2007a, 2010).

Indeed, despite the calls to bring together the three apparently supportive

pillars of sustainability, the economic and, to a lesser extent, the environmental imperatives nearly always take priority over the inherently political issues of social justice and cohesion, which are at best an afterthought, at worst ignored. As several scholars have argued, the urban sustainability framework has been 'neo-liberalised' and merged with ideas around ecological modernisation, which promotes the economic benefits of reducing environmental pollution and of mobilising more 'ecologically' rational resource management operations (Baker, 2007; Keil, 2007; see also Gibbs, 2006; Mol and Spaargaren, 2000). It promotes market-led, technocratic approaches to 'greening' capitalism and almost completely ignores issues of social justice and the processes of social inclusion and exclusion that run through urban environments and the very technological advancements they are advocating.

Rather than re-applying the social to the concept of sustainability, we propose—as do many radical scholars and activists—that we move beyond sustainability if we are to truly understand the links between cities and the environment (Braun, 2005; Keil, 2007; Swyngedouw, 2009; Cook and Swyngedouw, forthcoming). In this light, it is important to consider alternative, more radical frameworks that place the social at the centre of their analysis. One such approach is urban environmental justice, to which we shall now turn.

Urban Environmental Justice: From the Black Lung-producing-workplace to the Smog-laden Playgroundⁱ

Environmental justice (hereafter EJ) is at once a normative concept and a social movement (or rather a group of social movements). Its roots are in the US where a large number of environmental justice movements (EJMs) have emerged since the late 1970s alongside a voluminous set of academic literature which has rapidly gained in popularity since the mid 1990s. As we will show, however, an increasing multitude of scholars and social movements that work in, and on, European cities have increasingly drawn on the concept, discourses and networked resources of EJ to understand and contest the key *problématique* of EJ: that is, “the differential exposure to environmental ‘bads’ and access to environmental ‘goods’ experienced by different social groups” (Bickerstaff *et al.*, 2009, p. 592; see also Holifield *et al.*, 2010). Viewing the environment as “where we live, where we work, and where we play” (Dana Alston; quoted in Whitehead, 2009, p. 665) and linked to a variety of social injustices, EJ scholars and activists do not shy away from the social in the social cohesion, cities and environment nexus.

Unsurprisingly, the notion of justice is fundamental to EJ. Despite this, however, Schlosberg (2003) and Walker (2009a) have argued that the literature’s and movements’ references to justice are often vague or imprecise about “what the justice in environmental justice should constitute and why” (Walker, 2009a,

p. 203). Developing Iris Marion Young's (1990) work on the politics of difference, Schlosberg (2003, 2007) suggests that four interlinking dimensions of justice are central to EJ

1. *Distributional justice*. The need for environmental bads not to be concentrated in, or nearby, disadvantaged communities but (re)distributed more equally.
2. *Procedural justice*. The need for fairer and more democratic decision-making process and the involvement of disadvantaged groups within this.
3. *Recognitional justice*. The need for recognition and respect for the disadvantaged communities who suffer from environmental injustice and for those who participate in the EJ movement.
4. *Justice of capabilities*. The need to create "the capabilities necessary for a healthy, functioning community" (Schlosberg, 2007, p. 72).

This four-pronged normative understanding of justice goes beyond the often unidimensional focus of much of the early work on EJ which, as Lake (1996) argued, prioritised the distributional aspect of environmental injustice (see Cutter, 1995). Schlosberg also maintains that these four dimensions of justice cannot be conceived of, or actualised, in isolation. The justice of capabilities necessitates a political focus on distributional justice: healthy communities require some form of redistribution of environmental bads and goods. In order to achieve distributional justice and the justice of capabilities, procedural justice and

recognitional justice are necessary.

In a recent review of the EJ literature, Holifield et al. (2009) demonstrate that EJ has evolved significantly. For us, their review highlights five particularly important evolutions in the EJ literature. First, EJ studies have moved beyond the valuable but somewhat insular fascination with

whether polluting facilities or land uses were disproportionately sited in communities of color, or whether their spatial allocation simply reflected the dynamics of real estate markets (Holifield et al., 2009, p. 593; see for instance Been, 1994; Pastor et al., 2001).

They now examine a multitude of socially mediated environmental injustices from 'natural' disasters (Bullard and Wright, 2009) to transport (Sze, 2007) and the working conditions in and struggles over ship-building industries (Hillier, 2009; Bickerstaff and Agyeman, 2009). Secondly, EJ studies have become increasingly interdisciplinary, theoretically sophisticated and engaging with a wider variety of theoretical approaches from critical race theory (Kurtz, 2009) to actor-network theory (Bickerstaff and Agyeman, 2009) and Deleuzo-Guattarian perspectives (Hillier, 2009). Thirdly, EJ research has become more methodologically diverse with more emphasis on qualitative studies of the experiences and struggles of environmental injustice emerging (for example, Kurtz, 2002; Sze, 2007). Fourthly, empirical studies have moved beyond short-sighted debates over whether class

or race are the key determinates of environmental inequality and injustice, to consider the multiple and intersecting axes of inequalities that are wrapped up in EJ. Gender, age, disability, sexuality and several other factors from access to health care and insurance have been shown to influence the vulnerability of individuals and communities to socio-environmental harm (for example, Buckingham and Kulcur, 2009; Walker, 2009b). On top of this, following calls by Pulido (2000) and Morello-Frosch (2002), scholars have become increasingly conscious of the more structural processes that produce inequality rather than laying the blame solely at instances of overt deliberate discriminatory decision-making (for instance, by a factory owner or a city council committee).

The fifth evolution identified by Holifield and colleagues is the transnationalisation of the increasingly sophisticated EJ literature beyond its US heartlands. In part, this transnationalisation reflects the mobilisation of EJ campaigns to Europe, Africa and Australasia (Schlosberg, 2007; Schroeder *et al.*, 2008; Walker, 2009c) and the rise of transnational EJ movements and networks (Carruthers, 2008; Pellow, 2007). Studies of EJ in Europe have, for instance, considered the formation of EJMs in western as well as central and eastern Europe (Walker, 2009c; Agyeman and Ogneva-Himmelberger, 2009), the quantitative distribution of socio-environmental harm (Laurian, 2008), struggles over the distribution of toxicities (Bickerstaff and Agyeman, 2009; Davies, 2006) and the openness of environmental decision-making (Buckingham and Kulcur,

2009). As part of this internationalisation of EJMs, geographers have also begun to consider the nuanced ways in which understandings of EJ are transformed as its discourses and resources are mobilised and recontextualised in different localities and are structured by past political, economic and social legacies (Debbané and Keil, 2004; Walker, 2009c). As well as showing the necessity for EJ claims and movements to reflect the needs of particular contexts, the literature has shown that its initial US-centrism does not necessarily prevent critical and situated engagement with its ideas and resources by scholars and activists in Europe or places elsewhere.

With its widening empirical scope, its advancing theoretical sophistication and its increasing sensitivity to the multidimensionality of justice and place, and, unlike the sustainability literature, its insistence on focusing on the social in the social/cities/environment nexus, we believe that the EJ approach has much to offer. Nonetheless, we argue that such an approach can be complemented by the emerging work on urban political economy, a perspective that focuses directly on the socio-ecological mechanisms and relations that produce socio-environmental conflict and on urban socio-ecological conflicts and struggles, thereby foregrounding the political character of socio-ecological relations.

Urban Political Ecology

Whereas the EJ literature is primarily focused on the patterns of socio-spatial

environmental inequality and the political procedures through which they are mediated, the urban political ecology (hereafter UPE) literature is primarily concerned with the political-economic processes involved in the reworking of human–nonhuman assemblages and the production of socio-environmental inequalities. These processes are not backdrops to environmental injustice but actively constitute it and thus cannot be ignored. This section will outline how UPE scholars understand environmental inequalities and how this can complement the work of EJ scholars and activists.

UPE is a school of critical urban political-environmental research (Heynen *et al.*, 2006b). UPE takes many of its bearings from the wider and more voluminous, albeit by no means homogeneous, school of political ecology (for reviews, see Castree and Braun, 2001; Keil, 2003, 2005). Inspired by the early work of Piers Blaikie (1985; Blaikie and Bloomfield, 1987), David Harvey (1996) and Neil Smith (1984) amongst others, urban political ecologists have sought to understand the socio-material basis of environmental problems, while attempting to transcend binary perspectives on the nature–society interaction. A growing number of academic monographs have begun to chart the terrain of urban political ecology. *Nature's Metropolis* (Cronon, 1991), *Dead Cities* (Davis, 2002), *Concrete and Clay* (Gandy, 2003), *Social Power and the Urbanization of Water* (Swyngedouw, 2004), *Nature and City* (Desfor and Keil, 2004), *City of Flows* (Kaika, 2005) and *In the Nature of Cities* (Heynen *et al.*, 2006a) constitute some of the

foundational texts of urban political ecology. UPE has exposed two key popular misunderstandings about the relationship between society and nature. First, the artificial ontological divide between nature and society that exists in both mainstream academic and popular understandings of nature/society is questioned and alternative formulations explored. Political ecologists argue that nature and society do not exist independently of each other, but are intricately tangled in mutually constituted socio-natural assemblages. To illustrate this point, some writers have argued that there are few, if any, spaces of nature which are pristine or unaffected by human processes (think, for instance, of the global environmental effects of increasing carbon emissions). UPE scholars have countered the myth that towns and cities are “places where nature stops” (Hinchcliffe, 1999, p. 138), positing instead that nature has become urbanised and used in the process of making and remaking cities. Cities are conceptualised as metabolic vehicles constituted in and through metabolic circulatory socio-ecological flows. Drawing upon the work of Bruno Latour (1993) and Donna Haraway (1991), several UPE scholars have claimed that capitalism and urbanisation are fundamentally hybrid processes through which social and biophysical elements are assembled, entangled and transformed, and socio-natural cyborgs are produced (see Swyngedouw, 2006). Rethinking nature and society relations in this way has important implications for how we think about environmental justice. As Castree and Braun state

The crucial issue therefore, is not that of policing boundaries between “nature” and “culture” but rather, of taking responsibility for how our inevitable interventions in nature proceed—along what lines, with what consequences and to whose benefit (Castree and Braun, 1998, p. 34).

Secondly, UPE is critical of Malthusian influenced explanations of environmental degradation and resource depletion, which implicate overpopulation and poor people as the primary cause and culprits. Instead, it is argued that the variegated socio-ecological relations that shape capitalist market societies are responsible for the environmental condition the world is in. Drawing on historical materialism, O’Connor (1996) and Henderson (2009) have shown that the ceaseless quest for surplus value compels capitalists to extract and commodify more and more biophysical resources. In doing so, the capitalist circulation process and the drive to ‘accumulate for accumulation’s sake’ degrade the very resources that are necessary for capitalism’s reproduction. For many UPE scholars, the notion of metabolism is vitally important. Metabolism is the process whereby biophysical matter such as oil, pigs or oranges are transformed into “useable, ownable and tradable commodities” (Coe *et al.*, 2007, p. 161) through the exploitation of human labour (Swyngedouw, 2006). In this light, the act of socio-physically metabolising nature is a key process through which environmental injustice is exercised.

Power, urbanisation and scale are also central to UPE studies and, as we

shall explain, all three provide useful frames through which environmental injustice can be understood. To begin, UPE scholars assert that unequal power relations are inherently bound up in the metabolism of nature and, therefore, the urban environment is created by and embodies unequal power relations. Those in power are able to control who has access to resources (primarily through the money/property nexus), the quality of these resources and who can decide how resources are utilised (Swyngedouw, 2004; Swyngedouw and Heynen, 2003). Although the state plays a vital role in shaping these power relations (as we will explain later), class and other forms of social power are seen as the primary relations that produce inequalities. The wider political ecology literature has also considered questions of gender and race relations. A number of studies have sought to demonstrate how gendered and racial identities are constructed and performed, and how these identities influence their “access to particular types of knowledge, space, resources, and social-political process” and vice versa (Nightingale, 2006, p. 169; see also Rocheleau *et al.*, 1996).

Urbanisation is produced through particular forms of socio-physical metabolism (Swyngedouw, 2004, 2006). Exploitation and injustice are wrapped up in the metabolic making and remaking of the urban under capitalism. Directly and indirectly, key processes within contemporary urbanisation such as White flight, suburbanisation, gentrification, deindustrialisation and the development of new urban service-sector-based economies alter the lines of environmental inequality

in the city (Morello-Frosch, 2002; Pulido, 2000; Domene *et al.*, 2005).

Environmental inequality cannot be understood in isolation from these intersecting processes. In addition, these geographically uneven and socially unequal metabolic processes take on a decidedly 'scalar' form (Heynen, 2003; Swyngedouw and Heynen, 2003). On the one hand, activists utilise material and discursive scalar strategies (such as lobbying national and international governments) in order to advance their struggles (Kurtz, 2002; Towers, 2000). On the other hand, extra-local processes actively shape urban environmental injustices, from regional government decision-making over waste management to global climate change (Swyngedouw and Heynen, 2003; Bulkeley, 2005). Therefore, local communities can suffer from neglect or be exploited by actors and institutions operating at wider scales. Likewise local activists and communities can have their abilities to 'jump scale' curtailed by actors and institutions at other scales. What is clear, therefore, is that excessively localist readings of environmental injustice are completely inadequate for understanding the production and contestation of environmental injustice. Heynen (2003), for example, argues that environmental justice produced at one scale may lead to environmental injustices at other scales. Similarly, the production of environmental justice in one place may be produced through the degradation and exploitation of places elsewhere.

In summary, then, UPE scholars focus less on the instances of

environmental justice and injustice than their EJ counterparts. Rather, it is on the socio-ecological production of urban inequality that emphasis is placed. These approaches are by no means incompatible. Indeed, UPE can draw upon the insights provided by EJ studies of the experiences and patterns of environmental injustice to highlight empirically the inequality produced through urban metabolism. Emphasis on metabolism, urbanisation, scale and power, likewise, can add conceptual and theoretical depth to the more empirically driven analyses of EJ scholars.

New and Future Directions

Although many of the ways in which we understand the nexus between cities, social cohesion and the environment have become increasingly sophisticated, particularly in the field of urban political ecology, important gaps remain in our understandings of this nexus. In this section, we will explore four pressing issues that need to be addressed and how recent developments within the field can be utilised to address these.

The Socio-ecological Circulation of Urban Metabolisms: (Hybrid) Natures and (Cyborg) Cities

The urban political ecological approaches explored thus far illustrate how the city and urbanisation more generally can be viewed as a process of deterritorialisation and reterritorialisation of metabolic circulatory flows, organised through social

and physical conduits or networks of 'metabolic vehicles' (Virilio, 1986). These processes are infused by relations of power in which social actors strive to defend and create their own environments in a context of class, ethnic, racial and/or gender conflicts and power struggles. Under capitalism, the commodity relation and the flow of money attempt to suture the multiple socio-ecological processes of domination/subordination and exploitation/ repression that feed the urbanisation process and turn the city into a metabolic socio-environmental process that stretches from the immediate environment to the remotest corners of the globe (Kaika and Swyngedouw, 2000). Metabolism is not confined to the boundaries of a city but involves a complex process of linking places, and the humans and non-humans within these places, in uneven and contingent ways. These often deeply unjust networks through which cities and their inhabitants are linked with ecologies elsewhere have begun to be revealed in recent work on the transport of e-waste, household recycling and redundant ships from the cities of global North to those in the global South (Buerk, 2006; Pellow, 2007).

'Circulation' and 'metabolism' have become increasingly popular and theoretically advanced lenses through which to understand a series of interconnected, heterogeneous (human and non-human), dynamic, contested and contestable processes of continuous quantitative and qualitative transformations that rearrange humans and non-humans in new, and often unexpected, assemblages (Gandy, 2004; Swyngedouw, 2004). Such lenses permit grappling

with the social and the physical in non-dualistic and deeply political ways. The modern city becomes viewed as a process of fusing together the social and the physical to produce a distinct 'hybrid' or 'cyborg' urbanisation (Swyngedouw, 2006). Cyborg metaphors, in particular, are valuable ways in which to understand these urban assemblages, as Matthew Gandy details

The emphasis of the cyborg on the material interface between the body and the city is perhaps most strikingly manifested in the physical infrastructure that links the human body to vast technological networks. If we understand the cyborg to be a cybernetic creation, a hybrid of machine and organism, then urban infrastructures can be conceptualized as series of interconnecting life support systems. The modern home, for example, has become a complex exoskeleton for the human body with a provision of water, warmth, light and other essential needs. The home can be conceived as a 'prosthesis and prophylactic' in which modernist distinctions between nature and culture, and between the organic and the inorganic, become blurred (Gandy, 2005, p. 28).

Natures and cities are always heterogeneously constituted, the product of actants in metabolic circulatory processes. Metabolic circulation, then, is the socially mediated process of environmental-technological transformation and transfiguration, through which all manner of actants are mobilised, attached, collectivised and networked. These relations are invariably infused with myriad

configurations of power and social struggle that saturate material practices, symbolic ordering and imaginary visions. Urbanisation, in fact, is a process of geographically arranged socio-environmental metabolisms. It is mobilised through relations that combine the accumulation of socio-natural use and exchange-values, which shape, produce, maintain and transform the metabolic vehicles that permit the expanded reproduction of the urban as a historically determined but contingent form of life. Such socially driven material processes produce extended and continuously reconfigured, intended and non-intended spatial (networked and scalar) arrangements. These are saturated with heterogeneous symbolic and imaginary orders, albeit 'overdetermined' (Althusser, 1969) by the generalised commodity form that underpins the capitalist 'nature' of urbanisation. The phantasmagorical (spectacular) commodity form that most socio-natural assemblages take not only permits and facilitates a certain discourse and practice of metabolism, but also, perhaps more importantly, 'naturalises' the production of particular socio-environmental conditions and relations (Heynen *et al.*, 2006b).

Empirical research has begun to explore the assemblages, power inequalities, political practices and injustices wrapped up in the metabolism of cities (see for instance, Desfor and Keil, 2004; Gandy, 2003; Kaika, 2005; Swyngedouw, 2004). However, we believe that further consideration of the metabolism and circulation of cyborg cities is necessary. On the one hand, it will reveal further the contingent, constantly shifting and deeply uneven power

relations and injustices wrapped up in its production. On the other hand, it will help us to think critically about the types of cities in which we want to live in the future and what metabolisms and circulations make up these urban utopias. Such a research project requires unravelling the complex, shifting and power-laden social relationships that operate within cities and how these are mediated by and structured through processes of socio-ecological change. As part of this, future research must examine how the urban is constituted through socio-ecological metabolic flows (such as energy, CO₂, water, food, materials), sustained by a series of technological infrastructures and social, political and institutional support structures, and how these are wrapped up in the production of highly uneven socio-ecological configurations. Not only do we need to map, chart, analyse and understand the socio-ecological metabolism of cities, past and present, we also need to imagine critically the metabolised socio-ecological relations that would operate under the more radical utopian alternatives—for instance, of post-carbon communities (for example, Heinberg, 2006; Hopkins, 2008)—that are beginning to emerge. As part of this agenda, research must pay attention to the networked relations that stretch beyond the contemporary city to different scales and places (urban and rural), as well as those extra-urban relations that are being proposed (explicitly and implicitly) in urban utopias. How, might we ask, will a post-carbon city affect its inhabitants and, just as importantly, what will its ramifications be for people in other places?

Neo-liberalising Urban Environments

The state plays a pivotal role in the process of environmental injustice. Whether deliberately or not, it helps to shape who is exploited, ignored, rewarded and listened to, and how this privileging is exercised. It also has considerable power to exacerbate, displace or alleviate existing socio-environmental injustices or create entirely new ones. Many EJ and UPE studies have highlighted the role of formal state institutions and actors as decision-makers in, for example, the decisions about where toxic facilities should be located or how non-renewable resources will be utilised. Lavelle and Coyle (1993) have also shown that, while state laws can be highly discriminatory (for example, allowing some groups and not others access to environmental resources), the enforcement of these laws can be just as discriminatory, if not more so (for example, less rigorous enforcement of environmental protection laws in minority communities). These insights aside, the varied role of the state, its multiscalar arrangement and the practices of governance are somewhat under-researched in the EJ literature and, to a lesser extent, its UPE counterpart. The role of the state, we argue, needs to be placed more centrally within these literatures with increased linkages to the expansive and emerging work on neo-liberalisation.

Viewing neo-liberalisation as a contingent, path-dependent, amorphous and selective process of market-like state restructuring, scholars in geography and cognate disciplines have begun to reveal its discursive constructs, actually existing

and mutative forms, and its often socially regressive consequences (see for instance, Castree, 2008; Béal, 2009; Peck *et al.*, 2009). Studies have also shown that towns and cities in central and eastern Europe (CEE) are undergoing an uneven and path-dependent process of neo-liberalisation in the years after the breaking-up of market socialism (for example, Smith, 2007). The neo-liberalesque selective pluralisation of policy circles to incorporate business élites (primarily) and selective experts and community ‘representatives’ often through the setting-up of partnerships, as well as the increasing reliance on industry ‘self-regulation’ in the form of non-binding voluntary standards have also been revealed and critiqued (Guthman, 2007; Swyngedouw, 2005, 2009). Studies in political ecology have also shown how environmental management in western Europe and North America increasingly revolves around neo-liberal strategies—most noticeably privatisation, commercialisation and commodification—which seek, ultimately, to open up new avenues for capital accumulation (Bakker, 2005; Castree, 2005).

Clearly, then, neo-liberalisation has implications for environmental justice and urban socio-ecological cohesion. It could be hypothesised that neo-liberalisation is widening rather than resolving environmental injustices in our towns and cities, making it more difficult for minority groups to have equal access to good-quality environmental resources or for procedural equality in environmental decision-making to be achieved. As yet, we do not really know. Future research, therefore, needs to take up this glaring lacuna to see how the

nexus of neo-liberalisation and environmental (in)justice is actualised and to explore the range of oppositional tactics and strategies pursued in different urban contexts in and beyond Europe. Following Peck et al. (2009, p. 49), such analyses must view the practices and ramifications of neo-liberal statecraft *vis-à-vis* the “imprints of past regulatory struggles”—for instance, the contradictory legacies of market socialism in central and eastern Europe—“which recursively shape political capacities and orientations, and future pathways of neoliberal restructuring”. The socio-ecological implications, displacements and rhetoric of neo-liberal technologies and strategies such as auditing, ‘joined-up’ policy-making, urban spectacles, place marketing and gentrification should be critically analysed in relation to previous and long-standing technologies and strategies.

Urban Socio-ecological Movements and the Struggles for Justice

A key focus of the EJ literature is the ways in which people from disadvantaged communities in various localities have formed, or joined, movements to struggle for environmental justice, inclusion or equality. As Agyeman (2005) points out, rather than taking a progressive stance that outlines a vision of socio-ecological utopia, these movements have overwhelmingly taken a reactionary, defensive stance, demonstrating against existing or proposed injustices. Through case study research, the EJ literature has examined the formation and evolution of movements, their translation of grievances into ‘repertoires of action’, their collective identity politics and their influence on the targeted ‘mechanisms’ of

injustice. The UPE literature has focused less empirical attention on these movements but insists that how socio-natural relations are produced, by whom and for whom are subjected to intense social struggle and contestation (Swyngedouw and Heynen, 2003). It is through such struggle that policy agendas, organisational forms and governmental arrangements and interventions are forged.

What is striking about the EJ literature in particular is the lack of criticism directed towards the EJMs rather than the social structures and injustices they are faced with (Brulle and Pellow, 2005). We must ask difficult questions about EJMs. For instance, have movements developed agendas and alternatives that, if implemented, would simply act to reproduce or relocate injustices? Have they misunderstood or overlooked any environmental injustices? How inclusive are these movements? Are these movements' goals co-opted by more powerful bodies and, if so, how and why? Why have some movements dismantled or failed to achieve their goals? Why have certain disadvantaged communities not developed EJMs? What unequal power relations run through these movements and how do they influence their operations? These questions, of course, are suggested as ways of improving our understanding of these movements rather than as a means of undermining those who participate in such movements.

On top of a sporadic engagement with the social movement literature, the EJ and UPE literatures have rarely drawn upon the geographies of social

movements (GSM) literature. At its core, the GSM literature considers the role of spatiality in the emergence and performance of social movements (see for instance, Leitner *et al.*, 2008; Nicholls, 2009; Routledge, 2007) and we believe that engagement with this literature can provide more nuanced understandings of how the socio-spatial relationships between ecological conditions, urban politics and social movements operate. Work in UPE and political economy more generally, as noted earlier, has begun to show the importance of scale, showing how social movements engage in scalar strategies such as 'jumping scales' and discursively framing their plight as an 'issue' at one scale or across multiple scales amidst the continued reworking of scalar power relations. Like scale, place is also important to the dynamics of social movements. For Nicholls, people's 'sense of place' influences their

normative evaluations of what battles are worth fighting for, what battles are best left to others, who to co-operate with, and who to dispute (Nicholls, 2009, p. 80).

Questions, therefore, need to be asked about how those involved in producing, receiving and contesting environmental injustices view place (for example, workplace, community, river) and how this influences their willingness to pollute, exploit, struggle, persist and so on.

As noted earlier, a growing number of studies have pointed towards a

growing interconnectedness of place-based urban socio-ecological movements and a supposed internationalisation of environmental politics (for example, Carruthers, 2008; Pellow, 2007; Walker, 2009c). These studies have provided valuable insights but more research is needed on how and why such movements alter, expand or rescale their spatial focus; how and why their structures, tactics and discourses are replicated by groups in other places; and how and why they liaise and share resources with other groups. We also need to understand more about how meanings and values are constructed and contested within these translocal and transnational networks (Walker, 2009c). How, for instance, are one group's understandings of gender/environment relations projected, evaluated and reworked when they engage with groups in place elsewhere? To what extent have these meanings and values been universalised and, if they have, how do communities in particular places 'ground' these universalised meanings and values and with what implications? Following Routledge (2007), we also need to ask difficult questions about the uneven power relations, disagreements and fractures within these networks. And, of course, we must consider those groups who do not or rarely engage with groups elsewhere, their motivations for doing so and their structural constraints.

Urban Socio-ecological Imaginaries: The Discourses of Urban Natures

(In)justice and (in)equality in the urban environment and the forms of socio-ecological cohesion cannot be understood without reference to discursive

practices and their intertwining with material practices and outcomes. Three important and interlinked claims have been made in the more radical literatures on sustainability, discourse and the post-political condition which are pertinent to the nexus of cities, social cohesion and the environment. First, nature and its more recent derivatives, like 'environment' or 'sustainability', are 'empty' and 'floating' signifiers (Swyngedouw, 2010). Secondly, there is no such thing as a singular nature around which an urban environmental policy or environmentally sensitive planning can be constructed and performed. Rather, there are a multitude of natures and a multitude of existing, possible or practical socio-natural relations. Nature becomes a tapestry, a montage, of meaning and equivalences, held together with quilting points (or *points de capiton*) through which certain meanings of nature are knitted together, much like the upholstery of a Chesterfield sofa (Žižek, 1989; Stravakakis, 1997; Swyngedouw, 2010). Thirdly, the obsession with a singular nature that requires 'sustaining' or, at least, 'managing', is sustained by a particular 'quilting' of nature that forecloses asking political questions about immediately and really possible alternative urban socio-natural arrangements (Swyngedouw, 2010).

In part due to the growing global awareness of 'the environmental crisis', contemporary representations of nature have become more acute. The 'real' of nature, in the form of a wide variety of ecological threats (global warming, new diseases, biodiversity loss, resource depletion, pollution), has invaded and

unsettled our received understandings of nature. This has forced yet again a transformation of the signifying chains that attempt to provide 'content' for nature, while at the same time exposing the impossibility of capturing fully the 'real' of natures (Žižek, 2008a).

These radical arguments are structured by the fundamental belief that the natures we see and work with are necessarily imagined, scripted and symbolically charged. These inscriptions are always inadequate; they leave a gap, a remainder and maintain a certain distance from the natures that are there materially, which are complex, chaotic, often unpredictable, radically contingent, historically and geographically variable, risky, patterned in endlessly complex ways and ordered along 'strange' attractors (see for instance, Lewontin and Levins, 2007; Prigogine and Stengers, 1985). This means, quite fundamentally, that there is no nature out there that needs or requires salvation in the name of either nature itself or a generic humanity. There is nothing foundational in nature that needs, demands or requires sustaining. The debate and controversies over nature and what to do with it, in contrast, signal rather our political inability to engage in directly political argument and strategies about rearranging the socio-ecological coordinates of everyday life, the production of new socio-natural configurations and the constellations of socio-metabolic organisation (something usually called capitalism) that we inhabit. The notions of urban sustainability and sustainable planning/development have symptomatically become the hegemonically and

consensually agreed metaphors to signal the ecological quandary we are in (Swyngedouw, 2007b). Indeed, one of the key signifiers that has emerged as the pivotal 'empty' signifier to capture the growing concern for a nature that seemed to veer off-balance is, of course, 'sustainability'.

This scripting of nature permits and sustains a post-political arrangement sutured by fear and driven by a concern to manage things so that we can hold on to what we have (Swyngedouw, 2007a). This constellation leads Alain Badiou to insist that ecology has become the new opium for the masses (see Žižek, 2008a), replacing religion as the axis around which our fear of social disintegration becomes articulated (but also from where redemption, if the warnings are heeded, can be retrieved). Such ecologies of fear ultimately conceal, yet nurture, a conservative or, at least, reactionary discourse/ message. While clouded in rhetoric of the need for radical change in order to stave off imminent catastrophe, a range of technical, social, managerial, physical and other measures have to be taken to make sure that things remain the same, that nothing really changes, that life (or at least our lives) can go on as before. Is this not the underlying message of, for example, the documentary film *An Inconvenient Truth* or of the reports of the United Nation's Intergovernmental Panel on Climate Change (IPCC) on the human consequences of global climate change? Both these narratives, in their very different representational ways (popular/ populist on the one hand, 'scientific' on the other), urge radical changes in the techno-

organisational management of the socio-natural environment in order to ensure that the world as we know it stays fundamentally the same (Žižek, 2008b). This sentiment is also shared by Frederic Jameson (2003, p. 76) when he claims that “it is easier to imagine the end of the world than it is to imagine the end of capitalism”.

The discursive framing of nature as singular and in need of saving together with the process of post-politicalisation have enormous implications for inequality and injustice in the city. It could be reasonably argued that they rupture hopes for environmental justice, whether that be procedural justice (through the removal of real debate and dissensus) or the justice of capabilities (through blocking potential pathways to building a more socially and environmentally just society beyond the current status quo). Research has yet to delve fully into the complex linkages between discourse, post-political management and environmental (in)justice. More research is therefore needed on this issue. It is necessary to ask questions about what visions of nature and what socio-environmental relations are being promoted; what quilting points are being used and how they are being stitched together; and who are promoting these visions and why. Future research must also look at what issues and whose voices are being silenced in the process and how these discourses are competing with, altering and being altered by other alternative discourses. In this respect, research also needs to consider the discourses of the more radical voices such as those of the environmental justice

movements or the post-carbon protagonists. As part of this, it must critically examine how they portray nature and socio-environmental relations in the past, present and the utopian/dystopian future.

Conclusion

This paper has considered the important nexus between cities, social cohesion and the environment. In particular, it insisted that social inequality and conflict are intertwined with environmental processes as they materialise in urban form and process. It has critically overviewed a number of approaches through which this nexus has been considered by academics and non-academics, most noticeably those of urban sustainability, environmental justice and urban political ecology. It has argued that, while urban sustainability is fundamentally flawed— suffering from technocratism and an ignorance of the social—the approaches of environmental justice and urban political ecology hold significant merit. A fusion of these two approaches can offer a deeper understanding of the processes and patterns of environmental injustice and exclusion. Such a fusion, nonetheless, must place considerable emphasis on the city's positionality in wider political, economic and ecological processes and networks. Ontologically, it must be a political ecology of *urbanization*, not a political ecology *in the city*. Nevertheless, a simple fusion of the two approaches as they stand is not enough. As this paper has shown, there are four key areas in which further research is necessary if we are to get a more nuanced understanding of this nexus. The key areas for future

research can be summarised as follows

1. Research into the metabolism of past, present and future cyborg cities, focusing on the shifting power relations and inequalities within these transformations and the 'extra-local' networks and processes that constitute urban metabolism.
2. Research into the linkages between urban neo-liberalisation and environmental injustice, and the dynamics and ramifications of neo-liberal urban environmental projects such as ecological gentrification.
3. Research into the geographies of environmental justice movements and the contradictions of operationalising and networking such movements.
4. Research into the relationships between discourse, post-political management arrangements and environmental (in)justice, together with critical research into the visions of, and marginalisation of, alternative discourses.

Following this four-pronged research agenda, we believe, can bring new life into political ecological and environmental justice research. We also believe that it can help to stimulate a critical and political rethinking of the types of city-natures that we want to experience, now and in the future.

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ⁱ The section title is inspired by Whitehead who argues that by “relocating environmental politics and protest from the ex-urban spaces of (seemingly exotic) nature, to the Black lung-producing workplace, the asbestos-clad home and the smog-laden playground, the EJM has moved environmental policymaking into a locus of passion for many urban dwellers” (Whitehead, 2009, p. 665).