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introduction

Nature, technology and the modern city: an introduction

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One of modernity's most persistent examples of binary thinking has been its separation of 'the natural' from 'the social'. As Maria Kaika has noted, this ontological division has found a more precise spatial articulation in the nature/city dualism.[1] As nature's 'other', the modern city stands in stark opposition to the natural world, representing the triumph of human technology and reason over non-human environmental forces. Yet this insistence on the separation of nature from the modern city obscures the ongoing historical geographical processes of transformation which radically rework nature in the service of the city. In response, this issue of *cultural geographies* presents four articles that provide historical insights into the paradoxical relationship between nature and the modern city, revealing on the one hand how nature came to be discursively separated from (urban) culture and how, on the other, the production of modern city spaces was predicated on the coming together of human and non-human resources, leading to a fundamental remaking of what Erik Swyngedouw has termed 'socionatures'.[2] Of particular importance here is the idea of 'metropolitan' or 'urban natures', understood as hybrid products of nature, technology and design.

Over the past two decades the nature/society dualism, along with what Kaika calls modernity's 'Promethean project' of taming and controlling natural processes, have been the focus of a good deal of critical theoretical and empirical enquiry among geographers, historians and others.[3] The notion that nature is somehow external to social worlds and cultural apprehensions has been the focus of a broad interdisciplinary critique. Nature has come to be understood as something thoroughly social, and consequently shown to be complicit with the power and interests of specific groups of individuals. From the construction of knowledges about nature, to human interactions with the environment and to the ways in which societies physically transform and

reconstitute the natural world, nature has been shown to be thoroughly infused with social power.[4] Its definitions meanings and uses are all political, prompting Raymond Williams's astute observation that 'the idea of nature contains, though often unnoticed, an extraordinary amount of human history'.[5] This consensual appreciation of the socially constructed dimensions of nature (or, recognizing its frequently contested meanings, nature*s*) is nevertheless marked by a range of different approaches to theorizing nature/society relations. If Marxist-inspired critical realist approaches and feminist/post-structuralist analyses of the 'deeply discursive' cultural enframing of nature represent two ends of this spectrum, then some of the most innovative work on social natures has looked to science studies for theoretical inspiration.[6] Here the appropriation of ideas of hybridity and the insights of Actor Network Theory have been used to emphasize the diffuse and complex networks of power and combinations of human and non-human agents (or 'actants') in the co-construction of nature.[7]

Much of this resurgent theoretical interest in social natures can arguably be tied to a thoroughly modern *fin-de-siècle* anxiety about environmental issues, technological and scientific change and the intensified commodification of natural resources. The moral and political urgency surrounding issues ranging from global warming to ecological exploitation by multinational corporations and the consequences of biomedical mapping of gene systems has reawakened an interest in the contemporary society/ nature dynamic and the emancipatory possibilities of a reconfiguration of this relationship. It has also led to renewed concern for understanding histories of the nature–culture dualism, particularly as they emerged within the context of a post-Enlightenment modernity across the urban West. To a degree, this interest revives old themes in the debate about the modern, notably the displacement of the natural world by industrial methods of mass production, urban growth and instrumental reason. However, a reinvigorated urban environmental history has emerged as an important field of enquiry in the United States over the past 15 years and more recently within Europe, although it has arguably been less open to the kinds of theoretical approaches taken up by, for example, geographers.[8] William Cronon's seminal environmental history of Chicago was significant in demonstrating the complex, two-way relationships between the development of the city and its extensive 'natural' hinterland. In his account nature becomes inseparable from the city, reconstituted as a resource that underpins Chicago's remarkable development as a modern metropolis.[9] The agenda set by Cronon has been followed by other historians and geographers – often drawing on different theoretical tools and approaches – in order to explore other urban and metropolitan natures, from landscaped parks to complex water systems that link rivers and lakes in the hinterlands with the urban home.[10]

The relationship between nature and the modern city is central to the set of four articles we present in this issue.[11] Collectively, the articles serve both to historicize and to spatialize the natural, exploring the ways in which it has been incorporated into the conception and workings of the modern city. Matthew Gandy's opening essay considers the bio-political regulation of urban space and the urban constitution of bio-politics. Gandy examines how body and city have been articulated in the transition from the 'bacteriological city' of the later nineteenth and twentieth centuries to the

'anti-biotic' urbanism seen as taking shape since the 1970s. However, rather than simply partitioning these figures into discrete historical periods, Gandy suggests that they evoke the multiple modernities that are interwoven in particular cities at particular times. The remaining essays take up this call for historical and geographical texture.

For Christopher Otter, in his description of the regulation of animal production in Victorian London, the gradual removal and confinement of the sites of animal life and production, of urban dairies and slaughterhouses, to the urban fringe or out of the city altogether, contributed to the 'de-vitalization' or 'de-naturalization' of the city in the later nineteenth and early twentieth century. This was part of the movement by which the countryside was more firmly identified with 'nature', the urban with 'culture'; but insofar as nature was divorced from the city, this was the product of complex and piecemeal historical processes. Such processes of exclusion were paralleled by nature's incorporation within the modern city; nature became an essential ingredient of capitalist urbanization. Thus, Otter's account of the removal of some urban natures is also a narrative of the socialization of urban food, and about the transformation of the networks facilitating the ingestion of animal products. The public analysis and inspection of milk and meat in later Victorian London contributed to a reordering of the relationship between nature and urban civilization; by the intervention of scientific expertise, food became 'social', brought into the regulatory regime of commodities whose supply could not be safely ensured by individual endeavour or by virtue of the market alone.

Leif Jerram's discussion of kitchen design in public housing in interwar Frankfurt and Munich extends this interest in socio-spatial order and urban health, focusing more directly on the nature of the embodied subjectivities presumed and enforced by urban spaces. Jerram pays particular attention to the engineering of domestic space and life. His focus on the domestic sphere echoes other work on the way that the ideology of the modern home as an isolated private space of freedom is undermined by the socio-spatial networks and material and natural processes that underpin it.[12] Ulf Strohmayer's analysis of the construction of the Parc des Buttes-Chaumont in Second Empire Paris also understands 'urban nature' as something engineered, machine-like. Urban nature was a new nature, transformed by technology and new types of knowledge, and reinscribed in the urban environment. The Parc des Buttes-Chaumont was constructed at great speed under the direction of a leading civil engineer, on wasteland that had formerly been, amongst other things, a hanging ground and a sewage site. Opened in 1867, it formed part of the wider programme of Hausmannization that remodelled Paris in the service of security, utility and circulation, and created the stage-set of capitalist phantasmagoria that Walter Benjamin was to excavate at length in the 'Arcades project'.[13]

What is important here is not that the technological and scientific underpinned or determined urban nature, but that the mechanical and the natural were welded together in a new form of alliance. At the same time, the operations of this relationship were rendered invisible to the citizens in whose name such operations were increasingly enacted. The 'naturalness' of the park, with its concrete mountain and artificial waterfalls, required constant technical repairs to maintain its appearance; yet it

was carefully constructed, as Strohmayer observes, to erase all traces of the human labour that went into its fabrication. Similarly, in Otter's telling, the replacement of the traditional slaughterhouse by the modern 'abattoir' meant that the killing of animals was carried out in 'public', insofar as it was overseen by expert officials, but well away from the gaze, hearing and smell of urban dwellers as a whole.

The four papers bear the imprint of various theoretical strands that have been central to rethinking the society/nature dualism: Foucauldian governmentality, science studies and, less obvious perhaps, Walter Benjamin's idiosyncratic Marxism. Yet the articles occupy the moment 'after theory', to borrow Terry Eagleton's phrase; that is to say, while thoroughly imbued with theory, they draw on it eclectically and, in several senses, they wear their theory lightly.[14]

Nevertheless, we would argue that they develop two relatively fresh areas of concern within attempts to spatialize the nature/society dualism. The first has to do with analytic focus, the object(s) of study. In 1991 the environmental historian William Cronon called for a new attention to 'landscapes in which power and difference express themselves, even those that seem on the surface least natural: cities, highways, slums, factories, hospitals, corporations, military installations, all the many places that give shape to the modern world'.[15] Cronon's call was for the analysis of an urban or metropolitan nature of the type already indicated here, but he also sought to direct attention to the mundane spaces of everyday life. It corresponds partly to Gandy's notion of the 'zones of indistinction', the transitory, marginal sites of urban existence, sites of violence and exploitation that he locates in the interstices as well as on the margins of the global capitalist economy. It also finds echo in Leif Jerram's critique of a narrative of high modernism that prioritizes the iconic over the ordinary in architecture and form over effects in matters of design – 'our rites of passage are shaped by the banal, the inherited, the conventional'.

A further conspicuous emphasis in these essays is on the body, and particularly on the body/city nexus as a key to understanding the distinctive, historically shifting modernities that have characterised urban societies since the eighteenth century. In one sense there is little new in this emphasis on the relationship between body and city; it is a theme in psychoanalytic writing about the city, a consistent focus of the work of Richard Sennett as well, less directly, as that of Michel Foucault.[16] But here there is a stronger sense of the corporeal substance of bodies – 'the "fleshy" geographies of bodies as material eruptions in space', as Chris Philo puts it[17] – rather than of the body as psyche or as image in the idealist sense in which it figures in much social and cultural theory. This is most theoretically marked in Gandy's essay, but it is apparent equally in Jerram's study of women, modernity and city planning, where the focus is on the spatial and social effects of design on bodies as against its cultural or aesthetic impression.

Paralleling these shifts of analytic attention, and to a certain extent underpinning them, is an epistemological movement away from the cultural to the material, from questions of representation to matters of process, practice and effect. In this way the essays contribute to recent calls for a rematerialization of cultural and urban geography in order to be more attentive to the '"thingy", bump-into-able, stubbornly there-in-the-world kinds of matter' that shape people's spatial worlds.[18] The theme is most boldly

stated by Leif Jerram in his insistence on the physical and even coercive dimension of spatial relations: 'The spaces of a prison do not *suggest* imprisonment, by being repositories of symbols of imprisonment. The spaces of a prison *produce* imprisonment; being locked in a prison cell is not metaphorically constraining, but literally.' In a similar vein, Gandy proposes that historians and geographers should switch focus from 'abstract discursively constructed generalities' to 'concrete and specific manifestations of the bio-political realm'. Implicit here is a shift from the analysis of what things represent or mean to how they work and produce their effects. Hence Strohmayer's emphasis on the normative dimensions of urban nature, how it 'functions and what part it plays in the negotiations of historical and contemporary societies'. It is less the factitiousness of the nature/culture divide that interests both Strohmayer and Otter than the diffuse impact of changes in their interrelationship within the specific contexts of later nineteenth-century Paris and London, and the wider histories of urban modernity.

Collectively, then, these articles demonstrate how the production of urban spaces involved not so much the expulsion of the natural world as its radical reconstitution in the urban context. They represent significant strands of current geographical and historical thinking about the intersection of nature and technology in the making of the modern city. And in drawing attention to the material, the malleable and the mundane aspects of city life, they delineate many of the intellectual coordinates which are reshaping our understanding of the operations and the meanings of modern urbanism.

Notes

[1] M. Kaika, *City of flows: modernity, nature and the city* (London, Routledge, 2005), p. 5.

[2] E. Swyngedouw, 'Modernity and hybridity: nature, regenerationism and the production of the Spanish waterscape, 1890–1930', *Annals of the Association of American Geographers* 89 (1999), p. 443.

[3] Kaika, *City of flows*, pp. 11–13. The literature on these themes is vast, but works relevant here include S. Daniels, *Fields of vision: landscape imagery and national identity in England and the United States* (Cambridge, Polity Press, 1993); N. Green, *The spectacle of nature: landscape and bourgeois culture in nineteenth-century France* (Manchester, Manchester University Press, 1990); G. Kearns, 'Environmental history', in J. Duncan, N. Johnson and R. Schein, eds, *Companion to cultural geography* (Oxford, Blackwell, 2004), pp. 194–208; S. Schama, *Landscape and memory* (London, HarperCollins, 1995); T. Steinberg, 'Down to earth: nature, agency and power in history', *American historical review* 107 (2002), pp. 789–820; J.K. Stine and J.A. Tarr, 'At the intersection of histories: technology and the environment', *Technology and culture* 39 (1998), pp. 601–40; E. Swyngedouw, *Social power and the urbanisation of water* (Oxford, Oxford University Press, 2004); S. Whatmore, *Hybrid geographies: natures, cultures, spaces* (London, Sage, 2002). For a useful overview and range of theoretical approaches used by geographers, see N. Castree and B. Braun, eds, *Social nature: theory, practice, and politics* (Oxford, Blackwell, 2001).

[4] N. Castree 'Spatializing nature: theory practice and politics', in Castree and Braun, *Social nature*, pp. 13–16; T. Mitchell, *Rule of experts: Egypt, techno-politics, modernity* (Berkeley, University of California Press, 2002).

[5] R. Williams, 'Ideas of nature', in *Problems in materialism and culture* (London, New Left Books, 1980).

[6] A sense of these differing approaches and their critical contestation can be found in B. Braun and N. Castree, eds, *Remaking reality: nature at the millennium* (London, Routledge, 1998).

[7] See e.g. Whatmore, *Hybrid geographies*; N. Castree and T. MacMillan, 'Dissolving dualism: actor networks and the reimagination of nature', in Castree and Braun, *Social nature*, pp. 208–24.

[8] See J. Tarr, 'Urban history and environmental history in the United States: complementary and overlapping fields', in C. Bernhardt, ed., *Environmental problems in the European cities in the nineteenth and twentieth centuries* (New York, Waxman, 2001), pp. 25–39; M. Melosi, 'The place of the city in environmental history', *Environmental history review* 17 (1993), pp. 1–23; D. Schott, 'Towards a European urban environmental history', in D. Schott, B. Luckin and G. Massard-Guilbaud, eds, *The resources of the city: contributions to an environmental history of modern Europe* (Aldershot, Ashgate, 2005), pp. 1–27. See also the essays in the special edition of the *Journal of urban history* 20 (1994).

[9] W. Cronon, *Nature's metropolis: Chicago and the Great West* (New York, Norton, 1991).

[10] See e.g. M. Gandy, *Concrete and clay: reworking nature in New York City* (Cambridge, MA, MIT Press, 2002); Kaika, *City of flows*; M. Kaika, 'Interrogating the geographies of the familiar: domesticating nature and constructing the autonomy of the modern home', *International journal of urban and regional research* 28 (2004), pp. 265–86; E. Swyngedouw, *Social power and the urbanization of water: flows of power* (Oxford, Oxford University Press, 2004).

[11] Original versions of these papers were given at the 'Theorizing the modern city' strand of the Fifth European Social Science History Conference, Humboldt University, Berlin, 24–27 Mar. 2004. We would like to take the opportunity to thank all the paper-givers and the discussants for their contribution to what was a highly successful and intellectually profitable series of discussions.

[12] Kaika, 'Interrogating the geographies of the familiar'.

[13] W. Benjamin, *The Arcades Project*, trans. H. Eiland and K. McLaughlin (Cambridge, MA, Harvard University Press, 1999).

[14] T. Eagleton, *After theory* (London, Penguin, 2004).

[15] W. Cronon, 'Modes of prophecy and production: placing nature in history', *Journal of American history* 76 (1990), p. 1131.

[16] S. Pile, *The body and the city: psychoanalysis, subjectivity and space* (London, Routledge, 1996); R. Sennett, *The conscience of the eye: the design and social life of cities* (London, Faber & Faber, 1993); R. Sennett, *Flesh and stone: the body and the city in Western civilization* (London, Faber & Faber, 1996); M. Foucault, *Discipline and punish: the birth of the prison* (London, Penguin, 1991).

[17] C. Philo, 'More words, more worlds: reflections on the "cultural turn" and human geography', in I. Cook, D. Crouch, S. Naylor and J.R. Ryan, eds, *Cultural turns/geographical turns* (Harlow, Prentice Hall, 2000), p. 33.

[18] Philo, 'More words, more worlds', p. 33. For a discussion of the 're-materialization' of cultural geography, see B. Anderson and D. Tolia-Kelly, 'Matters in social and cultural geography', *Geoforum* 35 (2004), pp. 669–74, and the other essays in the accompanying special edition; and P. Jackson, 'Rematerializing social and cultural geography', *Social and cultural geography* 1 (2000), pp. 9–14. Loretta Lees has made a similar plea for the rematerialization of urban geography: 'Rematerializing geography: the "new" urban geography', *Progress in human geography* 26 (2002), pp. 101–12.