Environment and Planning A 2006, volume 38, pages 207 – 226

DOI:10.1068/a37268

The new mobilities paradigm

Mimi Sheller, John Urry
Department of Sociology, Lancaster University, Lancaster LA1 4YD, England;
e-mail: m.sheller@lancaster.ac.uk, j.urry@lancaster.ac.uk
Received 10 August 2004; in revised form 18 January 2005

Abstract. It seems that a new paradigm is being formed within the social sciences, the 'new mobilities' paradigm. Some recent contributions to forming and stabilising this new paradigm include work from anthropology, cultural studies, geography, migration studies, science and technology studies, tourism and transport studies, and sociology. In this paper we draw out some characteristics, properties, and implications of this emergent paradigm, especially documenting some novel mobile theories and methods. We reflect on how far this paradigm has developed and thereby to extend and develop the 'mobility turn' within the social sciences.

Introduction

All the world seems to be on the move. Asylum seekers, international students, terrorists, members of diasporas, holidaymakers, business people, sports stars, refugees, backpackers, commuters, the early retired, young mobile professionals, prostitutes, armed forces—these and many others fill the world's airports, buses, ships, and trains. The scale of this travelling is immense. Internationally there are over 700 million legal passenger arrivals each year (compared with 25 million in 1950) with a predicted 1 billion by 2010; there are 4 million air passengers each day; 31 million refugees are displaced from their homes; and there is one car for every 8.6 people. These diverse yet intersecting mobilities have many consequences for different peoples and places that are located in the fast and slow lanes across the globe. There are new places and technologies that enhance the mobility of some peoples and places *and* heighten the immobility of others, especially as they try to cross borders (Graham and Wood, forthcoming; Verstraete 2004). Many different bodies are on the move [and it is often through their movements and proximities that bodies are marked as 'different' in the first place (Ahmed, 2000)] and this movement shows relatively little sign of *substantially* abating in the longer term. This is so even after September 11, severe acute respiratory syndrome (SARS), multiple suicide bombings of transport networks, and other global catastrophes, and the fact that many grand projects in transport do not at first generate the scale of anticipated traffic.

Simultaneously the Internet has grown more rapidly than any previous technology, with significant impacts throughout much of the world (soon to be 1 billion users worldwide). New forms of 'virtual' and 'imaginative' travel are emerging, and being combined in unexpected ways with physical travel (see Germann Molz, this issue). Mobile telephony based on many societies jumping direct to such a new technology seems especially to involve new ways of interacting and communicating on the move, of being in a sense present while apparently absent (see papers in Brown et al, 2002; Callon et al, 2004). The growth of such information and communication technologies is allowing new forms of coordination of people, meetings, and events to emerge (see Büscher, 2006; Jain, forthcoming).

And materials too are on the move, often carried by these moving bodies whether openly, clandestinely, or inadvertently. Also the multinational sourcing of different components of manufactured products involves just-in-time delivery from around the world.

The 'cosmopolitanisation' of taste means that consumers in the 'North' expect fresh materials from around the world 'air freighted' to their table, while consumers in the 'South' often find more roundabout ways to access consumer goods from the North—carried by small-scale informal importers, packed into containers for relatives 'back home', or simply smuggled. And there are massive flows of illegal if very valuable other materials, including drugs, guns, cigarettes, alcohol, and counterfeit and pirated products. Mass media itself has a materiality as videos, DVDs, radios, televisions, camcorders, and mobile phones get passed from hand to hand (Schein, 2002; Spitulnik 2002).

Issues of movement, of too little movement or too much, or of the wrong sort or at the wrong time, are central to many lives and many organisations. From SARS to train crashes, from airport expansion controversies to SMS (short message service) texting on the move, from congestion charging to global terrorism, from obesity caused by 'fast food' to oil wars in the Middle East, issues of 'mobility' are centre stage. And partly as an effect a 'mobility turn' is spreading into and transforming the social sciences, transcending the dichotomy between transport research and social research, putting social relations into travel and connecting different forms of transport with complex patterns of social experience conducted through communications at-a-distance. It seems that a new paradigm is being formed within the social sciences, the 'new mobilities' paradigm. Some recent contributions to forming and stabilising this new paradigm include contributions from anthropology, cultural studies, geography, migration studies, science and technology studies, tourism and transport studies, and sociology (Ahmed et al, 2003; Amin and Thrift, 2002; Appadurai, 1996; Clifford, 1997; Coleman and Crang, 2002; Cresswell, 2001; Crouch and Lübbren, 2003; Degen and Hetherington, 2001; Ginsburg et al, 2002; Kaplan, 1996; Kaufmann, 2002; Mol and Law, 1994; Pascoe, 2001; Riles, 2001; Serres, 1995; Sheller, 2003; Urry, 2000; Verstraete and Cresswell, 2002; Virilio, 1997, as well as most papers in this theme issue).

In this paper we draw out some characteristics, properties, and implications of this emergent paradigm, to reflect on how far we have come and to extend and develop the 'mobility turn' within the social sciences.

Social science as static

Social science has largely ignored or trivialised the importance of the systematic movements of people for work and family life, for leisure and pleasure, and for politics and protest. The paradigm challenges the ways in which much social science research has been 'a-mobile'. Even while it has increasingly introduced spatial analysis the social sciences have still failed to examine how the spatialities of social life presuppose (and frequently involve conflict over) both the actual and the imagined movement of people from place to place, person to person, event to event. Travel has been for the social sciences seen as a black box, a neutral set of technologies and processes predominantly permitting forms of economic, social, and political life that are seen as explicable in terms of other, more causally powerful processes. As we shall argue, however, accounting for mobilities in the fullest sense challenges social science to change both the objects of its inquiries and the methodologies for research.

The emergent mobilities paradigm problematises two sets of extant theory. First, it undermines *sedentarist* theories present in many studies in geography, anthropology, and sociology. Sedentarism treats as normal stability, meaning, and place, and treats as abnormal distance, change, and placelessness. Sedentarism is often derived loosely from Heidegger, for whom dwelling (or *wohnen*) means to reside or to stay, to dwell at peace, to be content or at home in a place. It is the manner in which humans should inhabit the earth. He talks of dwelling places (Heidegger, 2002). Such sedentarism locates bounded and authentic places or regions or nations as the fundamental

basis of human identity and experience and as the basic units of social research (Cresswell, 2002, pages 12 – 15). It rests on forms of territorial nationalism and their associated technologies of mapping and visualisation which emerged out of the Enlightenment 'cosmic view' of the world (see Kaplan, this issue).

The way that social science is often sedentarist can be seen in one very mundane yet obvious example: its failure to examine the significance of the car (Sheller and Urry, 2000). It was in the modern city that the founders of sociology and urban studies first envisioned the contraction of social space, the density of transactions, the increased 'metabolism', and the compression of 'social distance' that comprised modernity. Yet sociology's view of urban life failed to consider the overwhelming impact of the automobile in transforming the time – space 'scapes' of the modern urban/suburban dweller. Industrial sociology, consumption studies, transportation studies and urban analyses have each been largely static (although see Hawkins, 1986; Lynch, 1993; Lynd and Lynd, 1937) failing to consider how the car reconfigures urban life, with novel ways of dwelling, travelling, and socialising in, and through, an automobilised time – space [although see Pooley et al (this issue), who argue that the rich have always had access to analogously individualised mobilities].

Automobility impacts not only on local public spaces and opportunities for coming together, but also on the formation of gendered subjectivities, familial and social networks, spatially segregated urban neighbourhoods, national images and aspirations to modernity, and global relations ranging from transnational migration to terrorism and oil wars (Sheller, 2004a). This sociotechnical system is not only a key form of contemporary mobility, but is furthermore interconnected with other mobile systems that organise flows of information, population, petroleum oil, risks and disasters, images and dreams [see Normark (this issue) on how these flows encounter each other in the 'petrol station']. The car is perhaps an obvious candidate for application of a more mobile perspective, but what if we were to open up all sites, places, and materialities to the mobilities that are always already coursing through them?

The mobilities paradigm indeed emphasises that all places are tied into at least thin networks of connections that stretch beyond each such place and mean that nowhere can be an 'island', as Braudel (1992) showed in the case of the complex trading and travel routes that constituted the Mediterranean world over many centuries. From the ships, sea routes, and interconnectivity of the Black Atlantic (Gilroy, 1993) to the complex mobilities of diasporas and transnational migrants in the modern world (Cohen, 1997), multiple interacting mobilities have long been significant. The claim to a 'new mobilities paradigm' is not simply an assertion of the novelty of mobility in the world today, although the speed and intensity of various flows are greater than before (but see Pooley et al, this issue), nor is it simply a claim that nation-state sovereignty has been replaced by a single system of mobile power, of 'empire': a 'smooth world', deterritorialised and decentred, without a centre of power, with no fixed boundaries or barriers (Hardt and Negri, 2000, page 136). It is rather part of a broader theoretical project aimed at going beyond the imagery of 'terrains' as spatially fixed geographical containers for social processes, and calling into question scalar logics such as local/global as descriptors of regional extent [see Tsing (2002, page 472) on tracking 'rhetorics of scale' and what counts as relevant scales]. Law (this issue) shows the complex interconnections between the various barriers and material flows that were implicated in the unpredicted spreading of foot and mouth disease in the United Kingdom in 2001, and how these could be tracked even further beyond the United Kingdom.

Second, our critique of 'static' social science also departs from those that concentrate on postnational *deterritorialisation* processes and the end of states as containers for societies. Theories of a 'liquid modernity' (Bauman, 2000) usefully redirect research away from static structures of the modern world to see how social entities comprise people, machines, and information/images in systems of movement. There is a shift from modernity seen as heavy and solid to one that is light and liquid and in which speed of movement of people, money, images, and information is paramount (Bauman, 2000). However, a research agenda addressing such mobilities need not embrace them as a supposed form of freedom or liberation from space and place. Specifically *nomadic* theory celebrates the opposite of sedentarism, namely, metaphors of travel and flight. These metaphors celebrate mobilities that progressively move beyond both geographical borders and also beyond disciplinary boundaries (Braidotti, 1994; Cresswell 2002, pages 15 – 18; Urry, 2000, chapter 2).

Although we call for a 'sociology beyond societies' (Urry, 2000), we do not insist on a new 'grand narrative' of mobility, fluidity, or liquidity. The new mobilities paradigm suggests a set of questions, theories, and methodologies rather than a totalising or reductive description of the contemporary world. Indeed, as other analysts of global networks argue, the increase in cross-border transactions and of "capabilities for enormous geographical dispersal and mobility" go hand in hand with "pronounced territorial concentrations of resources necessary for the management and servicing of that dispersal and mobility" (Sassen, 2002, page 2). Thus the new paradigm attempts to account for not only the quickening of liquidity within some realms but also the concomitant patterns of concentration that create zones of connectivity, centrality, and empowerment in some cases, and of disconnection, social exclusion, and inaudibility in other cases (Graham and Marvin 2001). Rights to travel are highly uneven and skewed even between a pair of countries [as Gogia (this issue) shows in the case of travel between Mexico and Canada]. The acceptance of "circulation rhetoric" often entails "the endorsement of multicultural enrichment, freedom, mobility, communication and creative hybridity", argues Tsing; but this need not prevent us from also examining "the material and institutional infrastructure of movement and pay[ing] special attention to the economic coercions and political guarantees that limit or promote circulation" (2002, pages 462 – 463).

The forms of detachment or 'deterritorialisation' associated with 'liquid modernity' (Bauman 2000) are accompanied by attachments and reterritorialisations of various kinds (Sheller, 2004a). The new paradigm emphasises how all mobilities entail specific often highly embedded and immobile infrastructures [Graham and Marvin (2001) and Sassen (2002); see also Marvin and Medd (this issue) on the material impacts of fat flowing in and under the city]. The petrol station (Normark, this issue) is a fixed entity that presupposes the emergent mobilities of the car. More generally there are interdependent systems of 'immobile' material worlds and especially some exceptionally immobile platforms (transmitters, roads, garages, stations, aerials, airports, docks). Mobility is always located and materialised, and occurs through mobilisations of locality and rearrangements of the materiality of places (Sheller, 2004a). The *complex* character of such systems stems from the multiple fixities or moorings often on a substantial physical scale that enable the fluidities of liquid modernity. Thus 'mobile machines', mobile phones, cars, aircraft, trains, and computer connections, all presume overlapping and varied time – space immobilities (see Graham and Marvin, 2001; Urry, 2003a, chapter 7). There is no linear increase in fluidity without extensive systems of immobility (Sassen, 2002). Such immobilities include wire and coaxial cable systems, the distribution of satellites for radio and television, the fibre-optic cabling carrying telephone, television, and computer signals, the mobile phone masts that enable

microwave channels to carry mobile phone messages (with new mobile phones now more common in the world than conventional land-line phones), and the massive infrastructures that organise the physical movement of people and goods (see Graham and Marvin, 2001).

Moreover, many feminist theorists have argued that nomadic theory rests on a "romantic reading of mobility", and that "certain ways of seeing [arise] as a result of this privileging of cosmopolitan mobility" (Kaplan, this issue). Ahmed critiques mobile forms of subjectivity and argues that the "idealisation of movement, or transformation of movement into a fetish, depends upon the exclusion of others who are already positioned as *not free in the same way*" (2004, page 152). Skeggs further argues that the mobility paradigm can be linked to a "bourgeois masculine subjectivity" that describes itself as "cosmopolitan"; she points out that "mobility and fixity are figured differently depending on national spaces and historical periods" (2004, page 48). Yet the new mobilities paradigm, as we argue here, moves on from this kind of disavowal of power, and fundamentally affirms the kind of analysis in which "Mobility and control over mobility both reflect and reinforce power. Mobility is a resource to which not everyone has an equal relationship" (Skeggs, 2004, page 49; Morley, 2000). It is not a question of privileging a 'mobile subjectivity', but rather of tracking the power of discourses and practices of mobility in creating both movement and stasis. A new mobilities paradigm delineates the context in which both sedentary and nomadic accounts of the social world operate, and it questions how that context is itself mobilised, or performed, through ongoing sociotechnical practices, of intermittently mobile material worlds [as Law (this issue) describes in the case of pigs, sheep, farmers, airborne disease, foodstuffs, people, and so on].

Indeed, the interest in theorising nomadism and deterritorialisation in the social sciences can in one direction be traced back to the critique of the colonial modes of ordering and knowing that informed many 20th-century human sciences (Bhabha, 1994; Clifford, 1992; 1997; Clifford and Dhareshwar, 1989; Hall 1990). Studies of migration, diasporas, and transnational citizenship offered trenchant critiques of the bounded and static categories of nation, ethnicity, community, place, and state within much social science (Basch et al, 1994; Brah, 1996; Gilroy, 1993; Ifekwunigwe, 1999; Joseph, 1999; Ong, 1999; Ong and Nonini, 1997; Van der Veer, 1995). These works, drawn not only from the social sciences but also from literary and cultural studies, highlight dislocation, displacement, disjuncture, and dialogism as widespread conditions of migrant subjectivity in the world today [and indeed in the past as in 19th-century Singapore (Wong, this issue)]. At the same time, they also foreground acts of 'homing' (Brah, 1996; Fortier, 2000) and 'regrounding' (Ahmed et al, 2003) which point toward the complex interrelation between travel and dwelling, home and not-home. In leaving a place migrants often carry parts of it with them which are reassembled in the material form of souvenirs, textures, foods, colours, scents, and sounds—reconfiguring the place of arrival both figuratively and imaginatively (Tolia-Kelly, this issue).

Although some critics argue that there is no analytical purchase in bringing together so broad a field—encompassing studies of exile, migration, immigration, migrant citizenship, transnationalism, and tourism—we argue that the project needs to be developed further. Especially valuable here are feminist transnational studies which examine how migrants reconstitute belonging and mobilise place-based identities across geopolitical borders (Fortier, 2000; Joseph, 1999; Tolia-Kelly, this issue). This approach highlights the relation between local and global 'power-geometries' (Massey, 1993), between the movements of people and of material belongings, and between the physical and symbolic dimensions of cultures of mobility (Sheller, 2003).

Gogia (this issue) shows the importance of various structures such as North American Free Trade Agreement or the EU that specifically facilitate and produce movement, producing symbolic and practical imbalances between what Mexicans and Canadians are able to do as people both on the move.

Yet these critical approaches have still had little effect in terms of how mainstream social science constitutes its object of inquiry. The new mobilities paradigm must be brought to bear not only on questions of globalisation and the deterritorialisation of nation-states, identities, and belonging, but more fundamentally on questions of what are the appropriate subjects and objects of social inquiry. Rifkin notes that contemporary 'science' no longer sees anything "as static, fixed and given" (2000, pages 191 – 193); rather, apparent hard and fast entities are always comprised of rapid movement and there is no structure separate from process. How do we frame questions and what methods are appropriate to social research in a context in which durable 'entities' of many kinds are shifting, morphing, and mobile? Is there (or should there be) a new relation between 'materialities' and 'mobilities' in the social sciences? And how are our very modes of 'knowing' being transformed by the very 'mobile' processes that we wish to study?

Multiple mobilities

Social science has thus been static in its theory and research. It has not sufficiently examined how, enhanced by various objects and technologies, people move. But also it has not seen how images and communications are also intermittently on the move and those actual and potential movements organise and structure social life. Mobilities in this paradigm is thus used in a broad-ranging generic sense, embracing physical movement such as walking and climbing to movement enhanced by technologies, bikes and buses, cars and trains, ships and planes [see Pooley et al (this issue) for a historical examination of their changing significance within everyday mobilities in 20th-century Britain].

Mobilities also includes movements of images and information on local, national, and global media. The concept embraces one-to-one communications such as the telegraph, fax, telephone, mobile phone, as well as many-to-many communications effected through networked and increasingly embedded computers. The study of mobility also involves those immobile infrastructures that organise the intermittent flow of people, information, and image, as well as the borders or 'gates' that limit, channel, and regulate movement or anticipated movement. And it involves examining how the transporting of people *and* the communicating of messages, information, and images increasingly converge and overlap through recent digitisation and extension of wireless infrastructures [as Germann Molz (this issue) examines in the case of round-the world travellers]. Studies of human mobility at the global level must be brought together with more 'local' concerns about everyday transportation, material cultures, and spatial relations of mobility and immobility, as well as with more 'technological' concerns about mobile information and communication technologies and emerging infrastructures of security and surveillance, including a kind of self-surveillance (Germann Molz, this issue).

Thus mobilities need to be examined in their fluid interdependence and not in their separate spheres (such as driving, travelling virtually, writing letters, flying, and walking). Transport researchers, for example, take the 'demand' for transport as largely given, as a black box not needing much further investigation, or as derived from the level of a society's income. They tend to examine simple categories of travel, such as commuting, leisure, or business as if these were separate and self-contained.

What is unusual is to begin from the complex patterning of people's varied and changing social activities. The developing and fulfilling of such activities then mean that travel is necessary for social life, enabling complex connections to be made, often as a matter of social (or political) obligation. Understanding such connections should not begin with the types and forms of transport [see Lassen (this issue) who focuses not on air transport but on the more general processes of 'aeromobility']. And the ways in which physical movement pertains to upward and downward social mobility is also central here. Moving between places physically or virtually can be a source of status and power [such as round-the world travellers (Germann Molz, this issue)]; or where movement is coerced it can be generate deprivation and untold suffering [as with economic migrants to Europe from Fujian province in China or to Canada from Mexico (see Gogia, this issue)]. Analysing mobilities involves examining many consequences for different peoples and places located in what we might call the fast and slow lanes of social life. There is the proliferation of places, technologies, and 'gates' that enhance the mobilities of some while reinforcing the immobilities of others, including those of children (see Pooley et al, this issue).

The significance of such fluid interdependence can be seen in Wittel's ethnography of 'network sociality' for some of those in the fast lane [and see Lassen (this issue) for the 'aeromobile' elite]. This he says involves: "cars, trains, buses and the underground, of airplanes, taxis and hotels, and it is based on phones, faxes, answering machines, voicemail, video-conferencing, mobiles, email, chat rooms, discussion forums, mailing lists and web sites" (Wittel, 2001, page 69). Axhausen (2002) notes the array of tools now necessary for successful 'networking': a car or the budget for taxis, budget and access for long-distance travel, location-free contact points (answering service, e-mail, website), and sufficient time or assistance to manage these components especially when one or other 'fails' (Shove, 2002, page 4). Indeed, the greater the proliferation of such 'tools' and hence the greater the networking possible, so the more that access to such tools is obligatory in order to participate fully in a 'networked society'. There is therefore a set of feedback mechanisms, a complex adaptive system, that extend the mobility burden as the range of 'network tools' expands and heightens the range, extent, and heterogeneity of social networks [Shove (2002); see Kesselring (this issue) on various mobility pioneers]. These networks can often be 'international' and this heightens the significance of such networking tools (see Lassen, this issue).

Social life thus seems full of multiple and extended connections often across long distances, but these are organised through certain nodes. Mobilities thus entail distinct social spaces that orchestrate new forms of social life around such nodes, for example, stations, hotels, motorways, resorts, airports, leisure complexes, cosmopolitan cities, beaches, galleries, and roadside parks. These are places of intermittent movement constituting for some at least relatively smooth 'corridors', according to Lassen (this issue).

Or connections might be enacted through less privileged spaces, on the street corners, subway stations, buses, public plazas, and back alleys where the less privileged might use pay-phones, beepers, or more recently short-text messaging to organise illicit exchanges, meetings, political demonstrations, or 'underground' social gatherings, what Rheingold (2002) terms 'smart mobs'. But as Law (this issue) points out, we are not dealing with a single network, but with complex intersections of 'endless regimes of flow', which move at different speeds, scales, and viscosities.

Also contra much transport research the time spent traveling is not dead time that people always seek to minimise. Whereas the transport literature tends to distinguish travel from activities, the new mobilities paradigm posits that activities occur while on the move, that being on the move can involve sets of 'occasioned' activities (Lyons and Urry, 2005). Research within the new mobilities paradigm examines the embodied

nature and experience of different modes of travel, seeing them in part as forms of material and sociable dwelling-in-motion, places of and for various activities (on cars, see Featherstone et al, 2004). These 'activities' can include specific forms of talk, work, or information gathering, but may involve simply being connected, maintaining a moving presence with others that holds the potential for many different convergences or divergences of physical presence [see Wong (this issue) on the affordances of different means of movement in 19th-century Singapore]. Not only does a mobilities perspective lead us to discard our usual notions of spatiality and scale, but it also undermines existing linear assumptions about temporality and timing, which often assume that actors are able to do only one thing at a time, and that events follow each other in a linear order [see Callon et al (2004) on how the apparently absent can yet in effect be present].

Furthermore, a clear distinction is often drawn between places and those travelling to such places. Places are seen as pushing or pulling people to visit. Places are presumed to be relatively fixed, given, and separate from those visiting. The new mobility paradigm argues against this ontology of distinct 'places' and 'people'. Rather, there is a complex relationality of places and persons connected through performances [see Büscher (this issue), as well as papers in Sheller and Urry (2004)]. Thus activities are not separate from the places that happen contingently to be visited. Indeed, the places travelled to depend in part upon what is practised within them, as Gogia (this issue) shows in the paradoxically interconnected cases of Mexico and Canada. Moreover, many such performances are intermittently mobile 'within' the destination place itself; travel is not just a question of getting to the destination (see Bærenholdt, 2004; Sheller and Urry 2004).

Thus there are hybrid systems, 'materialities and mobilities', that combine objects, technologies, and socialities, and out of those distinct places are produced and reproduced. This is so even where they are places of 'movement', such as places developed for North American backpackers in Mexico (Gogia, this issue), or the iconic motel (Morris, 1988). Places are thus not so much fixed as implicated within complex networks by which hosts, guests, buildings, objects, and machines are contingently brought together to produce certain performances in certain places at certain times.

Places are indeed dynamic—'places of movement' according to Hetherington [(1997); and see Wong (this issue) on 19th-century Singapore]. Places are like ships, moving around and not necessarily staying in one location. In the new mobilities paradigm, places themselves are seen as travelling, slow or fast, greater or shorter distances, within networks of human and nonhuman agents. Places are about relationships, about the placing of peoples, materials, images, and the systems of difference that they perform [see Wong (this issue) on the enormous complexity of traversing an apparently single place]. We understand 'where' we are through "vision in motion" (Büscher, this issue) practised through the alignment of material objects, maps, images, and a moving gaze (see also Kaplan, this issue).

And at the same time as places are dynamic, they are also about proximities, about the bodily copresence of people who happen to be in that place at that time, doing activities together, moments of physical proximity between people that make travel desirable or even obligatory for some (see Germann Molz, this issue; Urry, 2003b).

Theoretical resources for mobilities research

Drawing on theoretical resources within a postdisciplinary field that is converging around studies of space, place, boundaries, and movement, the new mobilities paradigm moves beyond sedentarist *and* nomadic conceptualisations of place and movement. In order to develop these notions six bodies of theory need to be enrolled within mobilities research.

We begin with Simmel, who established a broad agenda for the analysis of mobilities. He describes the human "will to connection" by contrast with animals that do not demonstrate such a will. Humans are able to impress "into the surface of the earth", generating a "freezing movement in a solid structure" (1997, page 171). This produces paths as well as "the miracle of the road" (page 171). This achievement of connection reaches its zenith with a bridge that connects two places; it "symbolizes the extension of our volitional sphere over space" (page 171). Thus Simmel sets an agenda that connects mobilities and materialities in a way that more recent theorists are continuing to pursue.

Crucial to his understanding of urbanism is the notion of "tempo", the pulse of city life which drives not only its social, economic, and infrastructural formations, but also the psychic forms of the urban dweller. Simmel describes the modern city as characterised by the "unexpectedness of onrushing impressions ... . With each crossing of the street, with the tempo and multiplicity of economic, occupational and social life, the city sets up a deep contrast with small town and rural life" (1997, page 175). And because of the richness of stimuli because of these multiple mobilities, people learn to develop an attitude of reserve and insensitivity to feeling. The urban personality is reserved, detached, and blasé.

Moreover, a new precision is necessary in city life. Agreements and arrangements need to demonstrate unambiguousness in timing and location. Life in the mobile onrushing city demands punctuality and this is demonstrated by the "universal diffusion of pocket watches" (Simmel, 1997, page 177). Simmel argues that the "relationships and affairs of the typical metropolitan usually are so varied and complex that without the strictest punctuality in promises and services the whole structure would break down into an inextricable chaos ... this necessity is brought about by the aggregation of so many people with such differentiated interests who must integrate their relations and activities into a highly complex organism" (page 177). So the forming of a complex system of relationships means that meetings and activities have to be punctual, timetabled, rational, a system or "structure of the highest impersonality" (page 178). But because of so much mobility in the metropolis there is a "brevity and scarcity of inter-human contacts" [(page 183); now even further advanced with round-the-world travelers and those who follow such travelings (Germann Molz, this issue)]. Simmel further argues that people are now attracted to each other simply for "free-playing sociability", for forms of social interaction freed from content, substance, and ulterior end. Copresent conversations can happen in and for themselves, a kind of "pure interaction", an end in itself [Simmel (1997, pages 9 – 10); see Gogia (this issue) on Canadian backpackers in Mexico].

If Simmel provides a key theoretical antecedent, the second body of theory we enlist is a more recent attempt to redescribe the taken-for-granted conditions of contemporary sociality. Science and technology studies show how "what we call the social is materially heterogeneous: talk, bodies, texts, machines, architectures, all of these and many more are implicated in and perform the social" (Law, 1994, page 2; this issue). Mobile sociotechnical systems should be analysed as hybrids, including even sewage systems in the contemporary city (Marvin and Medd, this issue). Mobilities involve complex "hybrid geographies" (Whatmore, 2002) of humans and nonhumans that contingently enable people and materials to move and to hold their shape as they move across various regions, such as the spread of the car system (Normark, this issue). Such analyses of hybrids also bring out that technologies do not necessarily produce effects and indeed new transport technologies are often very slow in their uptake (see Pooley, et al, this issue). Networks are on occasions tightly coupled with complex, enduring, and predictable connections between peoples, objects, and

technologies across multiple and distant spaces and times (Law, 1994, page 24; Murdoch 1995, page 745). Things are made *close* through these networked relations. Such assemblages extend not only to physical movement but to new forms of surveillances, what has been termed the 'surveillant assemblage' (see Germann Molz, this issue) or the 'cosmic gaze' (see Kaplan, this issue).

A third theoretical contribution to the new paradigm involves mobilising the 'spatial turn' in the social sciences. Although it began to be recognised that spatiality mattered in the 1980s (Soja, 1989), there is now a growing interest in the ways in which material 'stuff' makes up places, and such stuff is always in motion, being assembled and reassembled in changing configurations [assemblages that require various kinds of labour, as Law (this issue), Büscher (this issue), and Tolia-Kelly (this issue) show]. Theorists of 'relationality' and circulation are able to track 'partial connections' (Strathern, 1991) that disturb bipolar logics of the local and the global, or the mobile and the immobile, and suggest the coconstitution of embodiments, landscapes, and systems of local and global mobility (Maurer, 1997; Sheller, 2004b). A more relational approach to the classic problem of agency and structure brings to the fore the movements implicit in identifications, grammars, economies, intensities, and orientations; as people, capital, and things move they form and reform space itself (as well as the subjectivities through which individuals inhabit spaces) through their attachments and detachments, their slippages and 'stickiness' (Ahmed, 2004).

The fourth theoretical influence we draw on concerns the recentring of the corporeal body as an affective vehicle through which we sense place and movement, and construct emotional geographies. Various analyses show how means of travel are not only ways of getting as quickly as possible from A to B. Each means provides different experiences, performances, and affordances. The growth of the railway in the late 19th-century provided new ways of moving, socialising, and seeing [Schivelbusch (1986); see Wong (this issue) on the rickshaw]. The car too is increasingly revealed through studies as a place of 'dwelling' or corporeal inhabitation. It is experienced through a combination of senses and sensed through multiple registers of motion and emotion (Featherstone et al, 2004). There is a complex sensuous relationality between the means of travel and the traveller. Such sensuous geographies are not only located within individual bodies, but extend to familial spaces, neighbourhoods, regions, national cultures, and leisure spaces with particular kinaesthetic dispositions (Edensor, 2002; Sheller, 2004a).

It is also necessary to draw upon a fifth body of research that examines various topologies of social networks and especially the patterns of weak ties that may generate 'small worlds' amongst those apparently unconnected (Buchanan, 2002; Granovetter, 1983; Urry, 2004a; Watts, 1999; 2003). The natures of extensive weak ties stretching across time and space are important for examining putative global connections, as social life appears to move to a more networked model and where there is less likelihood of chance meetings (Axhausen, 2002). Lassen (this issue) shows the significance of 'aeromobility' in developing and extending such networked connections within various realms of professional work (Büscher, this issue). Sometimes, though, the analysis of mobilities suggests that we need to move beyond network topologies, to consider also topologies that may be more fluid, gel like, or even flickering like fire (Law, 2004; this issue; Mol and Law, 1994; Sheller, 2004c). Theorising how such complex patterns form and change will be crucial to future mobilities research as it intersects with scientific research into dynamical systems.

Finally, mobilities seem to involve the analysis of complex systems that are neither perfectly ordered nor anarchic (Capra, 2002; Urry, 2003a). There is an 'orderly disorder' present within dynamic or complex adaptive systems as analysed in recent formulations (Abbott, 2001; Byrne, 1998; Hayles, 1991; 1999; Prigogine, 1997; Urry 2003b).

Dynamic systems possess emergent properties. They develop over time so that national economies, corporations, and households are locked into stable 'path-dependent' practices [such as the steel-and-petroleum car (Urry, 2004b)]. Law (this issue) shows the side effects of increased abattoir hygiene which generated increased pig and sheep movements around Britain, and how this spread foot and mouth disease much more quickly. Systems are so tightly coupled that efforts logistically to separate control systems over flows of animals, meat products, immigrants, and diseases break down in the face of unpredictable formations such as those that might allow suspect meat in airport containers to reach swine feed, or prions in cow tissue to reach human brains. Disaster is one trigger for systemic change. But systems can also change through the accumulation of small repetitions reaching a 'tipping point' as with the explosive growth of mobile phone use or communications between offices using faxes (Gladwell, 2000), or the small causes that could conceivably tip the car system into a postcar system (Urry 2004b).

Thus far we have suggested an array of theoretical resources that can develop and enhance some early formulations of a mobility take present within some of Simmel's essays. In the next section we consider some novel methods and exemplars of research. Research methods will need to be 'on the move', in effect to simulate intermittent mobility. We now mention some such 'mobile methods' (see Bærenholdt et al, 2004).

Methods for mobilities research

Mobilities research is concerned first with the patterning, timing, and causation of face-to-face copresence. What brings person to person? When? How often? One way to ascertain this is through the 'observation' of people's movement, of bodies strolling, driving, leaning, running, climbing, lying on the ground, or as in the case of Normark's research (this issue), visiting a petrol station. This involves observing directly or in digitally enhanced forms mobile bodies undergoing various performances of travel, work, and play. Especially significant is the observation of how people effect a face-to-face relationship with places, with events and with people. Simmel placed particular emphasis upon the eye as a "unique sociological achievement" (1997, page 111). The eye effects the connection and interaction of individuals, it is the "most direct and purest interaction that exists" (page 111). People cannot avoid taking through the eye without at the same time giving. The eye produces "the most complete reciprocity; of person to person, face to face" (page 112). The expressive meaning of the face provides a special kind of knowing. The face tells others about it, it reveals that which has been deposited over the years [see Lassen (this issue) on how aeromobility makes such contacts seem necessary]. Mobilities especially involve occasioned, intermittent face-to-face conversations and meetings within certain places at certain moments that seem obligatory for the sustaining of families, friendship, workgroups, businesses, and leisure organisations (Amin and Thrift, 2002). Thus it is necessary to draw upon interactional, conversational, and biological analyses of how people read and interpret the face (Goffman, 1963; 1971; 1972; Hutchby, 2001; as well as Simmel, 1997).

Second, there are several emerging forms of 'mobile ethnography', which involve participation in patterns of movement while conducting ethnographic research. Schein employs a method she calls 'itinerant ethnography', which is "in spirit *siteless*, a recognition of the deterritorialized character" of contemporary diasporic communities; here research encounters might be "mobile—such as those with videos, video producers, and returned migrants to homeland sites—and hence require the tracking of movements" (2002, page 231). Such a mobilised ethnography could involve 'walking with' people as a form of deep engagement in their worldview (Morris, 2004), or following objects such as radios through their "individual and group mobilization

(use, placement, circulation)" as small mobile machines (Spitulnik, 2002). Through what we might call 'copresent immersion' the researcher can be copresent within modes of movement and then employ a range of observation, interviewing, and recording techniques (Laurier, 2002). Or it could involve 'participation-while-interviewing' (Bærenholdt et al, 2004), in which the ethnographer first participates in patterns of movement, and then interviews people, individually or in focus groups, as to how their diverse mobilities constitute their patterning of everyday life (for an example, see Büscher, this issue).

Third, there is the keeping of 'time–space diaries', in which respondents record what they were doing and where, and how they moved during those periods. Pooley et al (this issue) examine a single diary to recreate an account of 19th-century mobilities. Such a diary enables researchers to plot how the household, and indeed different household members, move through time–space and perform activities often on the move. The diary could be textual, pictorial, or digital. In a reflexive move one might also call for a more transparent accounting and accountability of the researcher's trajectories of travel and affordances for mobile research production. The vocabulary (and practices) of 'research' and 'findings', 'publication', and 'curriculum vitae' carries within it its own implicit infrastructures of inclusion and exclusion, mobility and immobility.

Fourth, there are varied methods of 'cyber-research' that explore the imaginative and virtual mobilities of people via their websites, multiuser discussion groups or listserves, as well as through the use of computer simulations. Germann Molz (this issue), for example, uses 'cyberethnography' to explore the interplay between round-the-world travel and round-the-world travelers' websites through a method combining web-surfing, in-person and e-mail interviewing, and interaction in interactive sites and discussion groups. Büscher (this issue) shows how computer simulations inform landscape design and how social research might potentially intervene in such design processes. Simulations are also used to model traffic flows through spaces such as congestion-charging zones or airport terminals, and such simulations can inform mobilities research (Adey and Bevan, forthcoming).

Fifth, there is imaginative travel normally involving experiencing or anticipating in one's imagination the 'atmosphere of place'. This necessitates novel research because atmosphere is neither reducible to the material infrastructures nor to the discourses of representation. It would involve multimedia methods (Halgreen, 2004). The atmosphere or 'feeling' of particular kinds of movement is often a concern in the poetry and literature of exile and displacement, and is central to practices of commemoration of traumatic events such as the Middle Passage during the slave trade. Social research needs to be more attentive to researching the affective dimension both of its subjects of research, and of its own performances (see Tolia-Kelly, this issue; Wong, this issue).

Sixth, much travel and communication involve the active development and performances of 'memory'. This necessitates research methods that simulate the active employment of photographs, letters, images, souvenirs, and objects. Lury (1997) has theorised different kinds of 'travelling objects', and cultural geographers often examine the kinds of pictures and objects that people carry with them and use to reassemble memories, practices, and even landscapes in their varied sites of dwelling (Tolia-Kelly, this issue). However, as much of this is familial or private there is a major challenge to get inside such private worlds and to excavate 'family secrets' especially about places of loss or desire (Kuhn, 1995). Ahmed considers how "emotions can move through the movement or circula-tion of objects. Such objects become sticky, or saturated with affect, as sites of personal and social tension ... [;] attachment takes place through movement" (2004, page 11).

Seventh, much mobilities research will need to examine multiple 'transfer points' (Kesselring, this issue), 'places of in-between-ness' involved in being mobile but immobilised in lounges, waiting rooms, cafés, amusement arcades, parks, hotels, airports, stations, motels, harbours. These transfer points necessitate a significant immobile network so that others can be on the move. They also entail new forms of 'interspace' (Hulme, forthcoming) or connected presence in which various kinds of meeting-ness are held in play while on-the-move. Material objects too move through such transfer points and they too need to be tracked in order for research to proceed. Law (this issue) notes the 2.5 million containers that enter the United Kingdom each year, many containing imported food that was the apparent source that culminated in the complex system effect of widespread foot and mouth disease in 2001.

To illustrate some elements of this new mobilities paradigm we turn briefly to the strange if iconic space of the new world order, the airport.

Airport spaces

Contemporary airports have historically developed from military airports. They emerge from the significance of air power and the huge military advantage that is accorded to those who control the air. As Kaplan (this issue) shows, movement through the air and the 'bird's eye' or cosmic view across land that air accords introduces a new and massively effective form of mobile power.

This sociotechnical system has been turned into a form of mass mobility. The contemporary carrying machine, the aeroplane, requires an exceptionally extensive and immobile place, the airport-city with tens of thousands of workers orchestrating the 4 million air journeys taking place each day (see Pascoe, 2001). This airport space is a place of transmission of people (and objects) *into* global relationships, what Gottdiener calls a "space of transition" that facilitates the shrinkage of the globe and the transcendence of time and space (2001, pages 10 – 11). Air travel is one 'space of flows' that increasingly moves people apparently (though never actually) seamlessly around the world especially connecting various hub airports located in major 'global' cities (Urry, 2000). This emphasises the *system* of airports that links together places, forming networks that bring connected places closer together, while distancing those places that are not so connected. It is the system of airports that is key to many global processes, permitting travellers to encounter many people and places from around the world, face to face (see Gogia, this issue; Lassen, this issue).

Moreover, contrary to the Augé's "cultural critique of placelessness" associated with analysis of nonplaces "where people coexist or cohabit without living together" (1995, page 110), airports do in fact possess a specific contingent materiality. They seem places of material organisation and considerable social complexity. Airports are places of "the boring, everyday, routine, but essential operations, processes, systems, and technologies, that enable global mobility to occur" (Parker, 2002, page 16). Airports are places of work for often tens of thousands of workers located within airport-cities. Various nonhuman actants, combined with rule-following humans, enable, for example, air traffic control systems to effect high levels of safe take-off and landings.

Airports are also a place of 'cybermobilities' (Adey and Bevan, forthcoming) in which software keeps the airport system functioning smoothly and transforms it into a kind of 'code/space' (Dodge and Kitchin, 2004). Wood and Graham (forthcoming) further suggest that automated software for sorting travellers as they pass through automated surveillance systems (such as iris-recognition systems) is increasingly producing a 'kinetic elite' whose ease of mobility differentiates them from the low-speed, low-mobility majority. Software also enables the tight coupling of distinctive airport systems—from the baggage X-ray and passenger surveillance systems to air traffic

control and mechanical systems, passenger ticketing and ground transportation, and human resource systems that manage flight crews, ground workers, and security staff—such that breakdowns in one component of an airport system often have knock-on effects which can cause lengthy delays.

Certain airports like Schiphol are being redesigned to make them destination places in their own right: "the implosive articulation of a many-purposed pedestrian crowd creates a critical mass of social density, much like the busy downtown district of a large central city. With enough interacting people, the scene itself emerges as a distinct feature of place" (Gottdiener, 2001, pages 21 – 22). As a consequence there is increasing 'dwelltime' in places of transit. In such places: "[I]nstead of experiencing waiting time as wasted time ... the urban traveller is invited to use transit time to accumulate useful experiences of leisure and work" (Lloyd, 2003, page 94). Other travellers may be inadvertently forced to live in airports, like the character Viktor Navorski played by Tom Hanks in Stephen Spielberg's film *The Terminal*. For those detained, there are few ways to use transit time, as they experience a disconnection not only from physical arrival, but also from means of communication such as mobile telephones or Internet access.

And increasingly air terminals are becoming like cities (Gottdiener 2001; Pascoe 2001) but also in what has been called the frisk society, cities are becoming like airports. The use of technologies such as detention centres, closed-circuit television (CCTV), Internet cafes, GPS (Global Positioning System), iris-recognition security, WiFi hotspots, and intermodal traffic interchanges are first trialed within airports before moving out as mundane characteristics of cities. And daily flows through airports contribute immensely to the production of contemporary urbanism, including diasporic cultural communities, 'ethnic' restaurants and neighbourhoods, distant families and cosmopolitan identities, and exclusive zones and corridors of connectivity for the fast-tracked kinetic elite.

The systems of airports are part of the process through which time and space are dramatically bent, as graphically seen in the events of September 11. Time – space is 'curved' into new complex configurations as the 'whole world' is brought dramatically closer (see Urry, 2002). Systems of interconnected material worlds produce *new* moments of unintended and dangerous copresence. The 'gates' designed to prevent networks from colliding (and the narratives of security that underwrote the building of those gatekeeping processes) are less sustainable as flows of terrorists slip under, over, and through various borders, eliminating the invisibilities and screens that kept networks apart.

More generally, the mobilities of money laundering, the drug trade, sewage and waste, infections, urban crime, asylum seeking, arms trading, people smuggling, slave trading, and urban terrorism, all make visible the already existing chaotic juxtaposition of different spaces and networks. Thus global diseases rapidly move: "The world has rapidly become much more vulnerable to the eruption and, more critically, to the widespread and even global spread of both new and old infectious diseases ... the dramatic increase in worldwide movement of people, goods and ideas is the driving force .... A person harbouring a life-threatening microbe can easily board a jet plane and be on another continent when the symptoms of illness strike. The jet plane itself, and its cargo, can carry insects and infectious agents into new ecologic settings" (Mann, cited in Buchanan, 2002, page 172). Time – space is thus 'curved' into new complex configurations. Only a few long-range transport connections are necessary to generate epidemics, such as SARS that occurred within the very mobile Chinese diaspora in 2003 [especially between south China, Hong Kong, and Toronto (Sum, 2004)], and thousands of apparently inconsequential movements of sheep combined with various transnational movements of meat and airplanes produced the rapid spread of foot and mouth disease during the UK outbreak of 2001 (Law, this issue).

New mobilities

These last points lead us on to consider what the new mobilities paradigm might say about some recent changes in mobilities. We briefly mention a few such developments.

First, material changes seem to be 'dematerialising' connections, as people, machines, images, information, power, money, ideas, and dangers are 'on the move', making and remaking networks at increasingly rapid speed across the world. Social networks are underpinned by technologies based upon timeframes transcending human consciousness. Computers make decisions in nanosecond time, producing instantaneous and simultaneous effects. Pervasive computing produces a switching and mobility between different self-reproducing systems, such as the Internet with its massive search engines, databases of information storage and retrieval, world money flows (especially through the ubiquitous 'spreadsheet culture'), intelligent transport systems, robotic vision machines under the oceans, and vision machines more generally (Kaplan, this issue; Thrift 2001).

Further, the 21st century will be organised around new 'machines' enabling 'people' to be more individually mobile through space, forming small world connections 'on the go'. 'Persons' will occur as various nodes in multiple machines of inhabitation and mobility. The 21st century will be the century of machines inhabited by individuals or very small groups of individuals. Through inhabiting (or internalising) such machines humans come to 'life'. Such machines are miniaturised, privatised, digitised and mobilised; they include walkmans, I-pods, mobile phones, the individual television, the networked computer/Internet, the individualised smart car/bike, virtual reality 'travel', tele-immersion sites, laptops, personal organisers, wireless connections, helicopters, smart small aircraft, and many others yet to emerge. Such machines are closely interwoven with the corporeal [see Bull (2000), on the Sony Walkman; and see Callon et al, (2004)].

There is increasing convergence between transport and communication, 'mobilising' the requirements and characteristics of copresence. And yet at the same time this dependence upon machines for movement means that life is increasingly sedentary even if people are on the go. Marvin and Medd (this issue) show how this results in increasing worldwide obesity, the more mobile the city, the greater it seems the surplus of 'fatty' bodies.

These 'mobility systems' are developing new characteristics. They are simply much more complicated, made up of very many elements and based upon specialised and arcane forms of expertise. Mobilities have always involved expert systems but these are now highly specialised, many based upon entire university degree programmes (such as BAs in golf course management) and specialised consultancy companies. Moreover, such systems are much more interdependent with each other so that individual journeys or pieces of communication depend upon multiple systems, all needing to function and interface successfully with each other. Indeed, since the 1970s, systems have been much more dependent upon computers and software. Software, we might say, writes mobility. There has been a huge generation of specific software systems that again need to speak effectively to each other in order that particular mobilities take place. And finally, these systems have become vulnerable, especially to what Perrow (1999) terms 'normal accidents' that are almost built in, almost certain to occur from time to time given the tightly locked-in nature of such systems, as Law (this issue) shows in the case of agriculture or water control systems.

And we cannot do without such systems. As daily and weekly time–space patterns in the richer parts of the world are desynchronised from historical communities and place, so systems provide the means by which to schedule work and social life. Organising 'copresence' with key others (workmates, family, significant others, friends)

becomes more demanding, with this loss of collective coordination within each day, week, year, and so on. 'Clusters' dissolve into more personal forms of networks, what Haythornthwaite and Wellman term 'personalised networking' (2002; Hampton and Wellman, 2001). With such desynchronisation the use of scheduling becomes more necessary. 'Personalised networking' entails a person-to-person connectivity, most visible with machines that enable immediate, mobile connectivity. There is an increasingly 'do-it-yourself' scheduling society commonplace in at least large cities across the world (Southerton et al, 2001). Thus the greater the personalisation of networks, the more important are systems to facilitate that personalisation. There is a spiralling, adaptive relationship effected through 'scheduling systems', while of course much of the world's population are unable to participate in a life on the move and are even more socially excluded.

Furthermore, as richer people move around developing their individual life projects they extend their personal networks and appear to exert increased 'agency'. But as they exert such 'agency' so much about them gets left behind in traces on countless computers: mobile phone records, use of automatic teller machines, creditworthiness ratings, CCTV images, differentiated insurance rates through GIS software, hotel bookings, GPS data, fingerprints, travel itineraries, bibliometric data, and so on. These have the effect of reconfiguring humans as bits of scattered informational traces resulting from various 'systems' of which most are unaware (Germann Molz, this issue; Kaplan, this issue).

Thus many individuals increasingly exist beyond their private bodies. They leave traces of their selves in informational space, as they are mobile through space because of 'self-retrieval' at the other end of a network. People are able to 'plug into' systems of information through which they can 'do' things and 'talk' to people without being present in a particular place. Illocutionary acts used to require copresence and utterances in public; they now require a click on 'OK'. Much of what was once 'private' already exists outside of the physical body and outside we might say the 'self'. The self is thus spread out or made mobile as a series of traces in cyberspace, even, or in fact especially, those who seek to get away from it all as round-the world travellers (Germann Molz, this issue).

Various sorting systems, in an effort to determine entry and exit, deploy detection systems and cyberimagery of 'strangers' and 'familiars' to simulate community on multiple screens in the workplace, home, car, airport, shopping centre, post office, bar, store, garage, train, aircraft, and so on (generally here see Graham, 2002).

This set of changes thus produces novel and 'flickering' combinations of presence *and* absence of peoples, enemies and friends. New mobilities are bringing into being new surprising combinations of presence and absence as the new century chaotically unfolds. Methods and theories will need to be ever on the move to keep up with these new forms of mobilities, new systems of scheduling and monitoring, and new pervasive modes of mobilised social inclusion/exclusion, as the various papers in this theme issue richly document.

References

Abbott A, 2001 *Time Matters* (University of Chicago Press, Chicago, IL)
Adey P, Bevan P, forthcoming, "Between the physical and the virtual: connected mobilities", in *Mobile Technologies of the City* Eds M Sheller, J Urry (Routledge, London)
Ahmed S, 2000 *Strange Encounters: Embodied Others in Postcoloniality* (Routledge, London)
Ahmed S, 2004 *The Cultural Politics of Emotion* (University of Edinburgh, Edinburgh)
Ahmed S, Castañeda C, Fortier A, Sheller M (Eds), 2003 *Uprootings/Regroundings: Questions of Home and Migration* (Berg,Oxford)
Amin A, Thrift N, 2002 *Cities: Reimagining the Urban* (Polity, Cambridge)

Appadurai A, 1996 *Modernity at Large: Cultural Dimensions of Globalization* (University of Minnesota Press, Minneapolis, MN)
Augé M, 1995 *Non-places* (Verso, London)
Axhausen K, 2002, "A dynamic understanding of travel demand: a sketch", paper presented to ESRC Mobile Network Workshop, Cambridge; copy available from Eidgenössische Technische Hochschule, Zurich
Bærenholdt J O, Haldrup M, Larsen J, Urry J, 2004 *Performing Tourist Places* (Ashgate, Aldershot, Hants)
Basch L, Glick Schiller N, Szanton Blanc C, 1994 *Nations Unbound: Transnational Projects, Postcolonial Predicaments, and Deterritorialized Nation-states* (Gordon and Breach, Amsterdam)
Bauman Z, 2000 *Liquid Modernity* (Polity, Cambridge)
Bhabha H, 1994 *The Location of Culture* (Routledge, London)
Brah A, 1996 *Cartographies of Diaspora: Contesting Identities* (Routledge, London)
Braidottti R, 1994 *Nomadic Subjects: Embodiment and Sexual Difference in Contemporary Feminist Theory* (Columbia University Press, New York)
Braudel F, 1992 *The Mediterranean and the Mediterranean World in the Age of Philip 11* (BCA, London)
Brown B, Green N, Harper R (Eds), 2002 *Wireless World* (Springer London)
Buchanan M, 2002 *Small World: Uncovering Nature's Hidden Networks* (Weidenfeld and Nicolson, London)
Bull M, 2000 *Sounding Out the City* (Berg, Oxford)
Büscher M, 2006, "Vision in motion" *Environment and Planning A* **38** 281 – 299
Byrne D, 1998 *Complexity Theory and the Social Sciences* (Routledge, London)
Callon M, Law J, Urry J (Eds), 2004, "Absent presence: localities, globalities, and methods", special issue of *Environment and Planning D: Society and Space* **22**(1) 3 – 190
Capra F, 2002 *The Hidden Connections. A Science for Sustainable Living* (HarperCollins, London)
Clifford J, 1992, "Traveling cultures", in *Cultural Studies* Eds L Grossberg, C Nelson, P Treichler (Routledge, New York)
Clifford J, 1997 *Routes: Travel and Translation in the Late Twentieth Century* (Harvard University Press, Cambridge, MA)
Clifford J, Dhareshwar V (Eds), 1989 *Traveling Theory, Traveling Theorists/Inscriptions* Group for the Critical Study of Colonial Discourse and the Center for Cultural Studies, Santa Cruz, CA
Cohen R, 1997 *Global Diasporas* (UCL Press, London)
Coleman S, Crang M (Eds), 2002 *Tourism Between Place and Performance* (Berghahn Books, Oxford)
Cresswell T (Ed.), 2001, "Mobilities", special issue of *New Formations* **43** (Spring)
Cresswell T, 2002, "Introduction: theorizing place", in *Mobilizing Place, Placing Mobility* Eds G Verstraet, T Cresswell (Rodopi, Amsterdam) pp 11 – 32
Crouch D, Lübbren N (Eds), 2003 *Visual Culture and Tourism* (Berg, Oxford)
Degen M, Hetherington K 2001, "Hauntings" *Space and Culture* **11/12** 1 – 6
Dodge M, Kitchin R, 2004, "Flying through code/space: the real virtuality of air travel" *Environment and Planning A* **36** 195 – 211
Edensor T, 2002 *National Identities in Popular Culture* (Berg, Oxford)
Featherstone M, Thrift N, Urry J (Eds), 2004, "Cultures of automobility", special issue of *Theory, Culture and Society* **21** 1 – 284
Fortier A M, 2000 *Migrant Belongings: Memory, Space, Identity* (Berg, Oxford)
Germann Molz J, 2006, " 'Watch us wander': mobile surveillance and the surveillance of mobility" *Environment and Planning A* **38** 377 – 393
Gilroy P, 1993 *The Black Atlantic: Modernity and Double Consciousness* (Verso, London)
Ginsburg F, Abu-Lughod L, Larkin B, 2002 *Media Worlds: Anthropology on New Terrain* (University of California Press, Berkeley, CA)
Gladwell M, 2000 *Tipping Points. How Little Things can make a Big Difference* (Little, Brown, Boston, MA)
Goffman E, 1963 *Behaviour in Public Places* (Free Press, New York)
Goffman E, 1971 *Relations in Public* (Penguin, Harmondsworth, Middx)
Goffman E, 1972 *Interaction Ritual* (Penguin, Harmondsworth, Middx)
Gogia N, 2006, "Unpacking corporeal mobilities: the global voyages of labour and leisure" *Environment and Planning A* **38** 359 – 375
Gottdiener M, 2001 *Life in the Air* (Rowman and Littlefield, Oxford)
Graham S (Ed.), 2002 *The Cybercities Reader* (Routledge, London)

Graham S, Marvin S, 2001 *Splintering Urbanism* (Routledge, London)
Graham S, Wood D, forthcoming ,"Permeable boundaries and the software-sorted society: surveillance and the differentiation of mobility", in *Mobile Technologies of the City* Eds M Sheller, J Urry (Routledge, London)
Granovetter M, 1983, "The strength of weak ties: a network theory revisited" *Sociological Theory* **1** 203 – 233
Halgreen T, 2004, "Tourists in the concrete desert", in *Tourism Mobilities: Places to Play, Places in Play* Eds M Sheller, J Urry (Routledge, London) pp 143 – 154
Hall S, 1990, "Cultural identity and diaspora", in *Identity: Community, Culture Difference* Ed. J Rutherford (Lawrence and Wishart, London) pp 222 – 237
Hampton K, Wellman B, 2001, "Long distance community in the network society: contact and support beyond Netville" *American Behavioral Scientist* **45** 477 – 496
Hardt M, Negri A, 2000 *Empire* (Harvard University Press, Cambridge, MA)
Hawkins R, 1986,, "A road not taken: sociology and the neglect of the automobile" *California Sociologist* **9** 61 – 79
Hayles N K (Ed.), 1991 *Chaos and Order: Complex Dynamics in Literature and Science* (University of Chicago Press, Chicago, IL)
Hayles N K, 1999 *How We Became Posthuman* (University of Chicago Press Chicago, IL)
Haythornthwaite C, Wellman B, 2002, "The internet in everyday life: an introduction", in *The Internet in Everyday Life* Ed. B Wellman, C Haythornthwaite (Blackwell, Oxford) pp 3 – 41
Heidegger M, 2002, "Building dwelling thinking", in *Basic Writings* (Routledge, London) pp 347 – 363
Hetherington K, 1997, "In place of geometry: the materiality of place", in *Ideas of Difference* Eds K Hetherington, R Munro (Blackwell, Oxford) pp 183 – 199
Hulme M, forthcoming, "Examining inter-space", in *Mobile Technologies of the City* Eds M Sheller, J Urry (Routledge, London)
Hutchby I, 2001 *Conversation and Technology* (Polity, Cambridge)
Ifekwunigwe J, 1999 *Scattered Belongings: Cultural Paradoxes of 'Race', Nation and Gender* (Routledge, London)
Jain J, forthcoming, "Bypassing and WAPing: reconfiguring time-tables for 'real-time' mobility", in *Mobile Technologies of the City* Eds M Sheller, J Urry (Routledge, London)
Joseph M, 1999 *Nomadic Identities: The Performance of Citizenship* (University of Minnesota Press, Minneapolis, MN)
Kaplan C, 1996 *Questions of Travel* (Duke University Press, Durham, NC)
Kaplan C, 2006, "Mobility and war: the cosmic views of US 'air power' " *Environment and Planning A* **38** 395 – 407
Kaufmann V, 2002 *Re-thinking Mobility. Contemporary Sociology* (Ashgate, Aldershot, Hants)
Kesselring S, 2006, "Pioneering mobilities: new patterns of movement and motility in a mobile world" *Environment and Planning A* **38** 269 – 279
Kuhn A, 1995 *Family Secrets: Acts of Memory and Imagination* (Verso, London)
Lassen C, 2006, "Aeromobility and work" *Environment and Planning A* **38** 301 – 312
Laurier E, 2002, "The region as a socio-technical accomplishment of mobile workers", in *Wireless World* Eds B Brown, N Green, R Harper (Springer, London) pp 46 – 60
Law J, 1994 *Organizing Modernity* (Blackwell, Oxford)
Law J, 2004, "And if the global were small and noncoherent? Method, complexity, and the baroque" *Environment and Planning D: Society and Space* **22** 13 – 26
Law J, 2006, "Disaster in agriculture: or foot and mouth mobilities" *Environment and Planning A* **38** 227 – 239
Lloyd J, 2003, "Dwelltime: airport technology, travel and consumption" *Space and Culture* **6** 93 – 109
Lury C, 1997, "The objects of travel", in *Touring Cultures: Transformations of Travel and Theory* Eds C Rojek, J Urry (Routledge, London) pp 75 – 95
Lynch M, 1993 *Scientific Practice and Ordinary Action* (Cambridge University Press, Cambridge)
Lynd R, Lynd H, 1937 *Middletown in Transition* (Harvest, New York)
Lyons G, Urry J, 2005, "Travel time use in the information age" *Transport Research A* **39** 257 – 276
Marvin S, Medd W, 2006, "Metabolisms of obe*city*: flows of fat through bodies, cities, and sewers" *Environment and Planning A* **38** 313 – 324
Massey D, 1993, "Power-geometry and a progressive sense of place", in *Mapping the Futures: Local Cultures, Global Change* Ed J Bird, B Curtis, T Putnam, G Robertson, L Tickner (Routledge, London) pp 59 – 69

Maurer B, 1997 *Recharting the Caribbean: Land, Law and Citizenship in the British Virgin Islands* (University of Michigan Press, Ann Arbor, MI)
Mol A, Law J, 1994, "Regions, networks and fluids: anaemia and social topology" *Social Studies of Science* **24** 641 – 671
Morley D, 2000 *Home Territories: Media, Mobility and Identity* (Routledge, London)
Morris J, 2004 *Locals and Experts: The New Conservation Paradigm in the MANU Biosphere Reserve, Peru and the Yorkshire Dales National Park, England* unpublished PhD thesis, Department of Sociology, Lancaster University, Lancaster
Morris M, 1988, "At Henry Parkes Motel" *Cultural Studies* **2** 1 – 47
Murdoch J, 1995, "Actor-networks and the evolution of economic forms: combining description and explanation in theories of regulation, flexible specialization, and networks" *Environment and Planning A* **27** 731 – 757
Normark D, 2006, "Tending to mobility: intensities of staying at the petrol station" *Environment and Planning A* **38** 241 – 252
Ong A, 1999 *Flexible Citizenship: The Cultural Logics of Transnationality* (Duke University Press, Durham, NC)
Ong A, Nonini D (Eds), 1997 *Ungrounded Empires: The Cultural Politics of Modern Chinese Transnationalism* (Routledge, New York)
Parker K, 2002, "Making connections: travel, technology and global air travel networks", in *Proceedings of Social Change in the 21st Century, November* Eds B E Hanna, E J Woodley, J A Summerville, E L Buys (Queensland University of Technology, Brisbane)
Pascoe D, 2001 *Airspaces* (Reaktion, London)
Perrow C, 1999 *Normal Accidents* (Princeton University Press, Princeton, NJ)
Pooley C, Turnbull J, Adams M, 2006, "The impact of new transport technologies on intraurban mobility: a view from the past" *Environment and Planning A* **38** 253 – 267
Prigogine I, 1997 *The End of Certainty* (The Free Press, New York)
Rheingold H, 2002 *Smart Mobs.The Next Social Revolution* (Basic Books, Cambridge, MA)
Rifkin J, 2000 *The Age of Access* (Penguin, London)
Riles A, 2001 *The Network Inside Out* (University of Michigan Press, Ann Arbor, MI)
Sassen S, 2002, "Introduction: locating cities on global circuits", in *Global Networks, Linked Cities* Ed. S Sassen (Routledge, New York) pp 1 – 38
Schein L, 2002, "Mapping Hmong media in diasporic space", in *Media Worlds: Anthropology on New Terrains* Eds F Ginsburg, L Abu-Lughod, B Larkin (University of California Press, Berkeley, CA) pp 229-244
Schivelbusch W, 1986 *The Railway Journey: Trains and Travel in the Nineteenth Century* (Blackwell, Oxford)
Serres M, 1995 *Angels: A Modern Myth* (Flammarion, Paris)
Sheller M, 2003 *Consuming the Caribbean* (Routledge, London)
Sheller M, 2004a, "Automotive emotions: feeling the car" *Theory, Culture and Society* **21** 221 – 242
Sheller M, 2004b, "Demobilising and remobilising the Caribbean", in *Tourism Mobilities: Places to Play, Places in Play* Eds M Sheller, J Urry (Routledge, London) pp 13 – 21
Sheller M, 2004c, "Mobile publics: beyond the network perspective" *Environment and Planning D: Society and Space* **22** 39-52
Sheller M, Urry J, 2000, "The city and the car" *International Journal of Urban and Regional Research* **24** 737 – 757
Sheller M, Urry J (Eds), 2004 *Tourism Mobilities: Places to Play, Places in Play* (Routledge, London)
Shove E, 2002, "Rushing around: coordination, mobility and inequality", paper presented to ESRC Mobile Network Meeting, Department for Transport, London, October; copy available from Department of Sociology, Lancaster University, Lancaster
Simmel G, 1997 *Simmel on Culture* Eds D Frisby, M Featherstone (Sage, London)
Skeggs B, 2004 *Class, Self, Culture* (Routledge, London)
Soja E, 1989 *Postmodern Geographies: The Reassertion of Space in Critical Social Theory* (Verso, London)
Southerton D, Shove E, Warde A, 2001 "Harried and hurried: time shortage and coordination of everyday life", CRIC DP 47, University of Manchester, Manchester
Spitulnik, D 2002, "Mobile machines and fluid audiences: rethinking reception through Zambian radio culture", in *Media Worlds: Anthropology on New Terrains* Eds F Ginsburg, L Abu-Lughod, B Larkin (University of California Press, Berkeley, CA) pp 337 – 354
Strathern M, 1991 *Partial Connections* (Rowman and Littlefield, Savage, MD)

Sum N-L, 2004, "The paradox of a tourist centre: Hong Kong as a site of play and a place of fear", in *Tourism Mobilities: Places to Play, Places in Play* Eds M Sheller, J Urry (Routledge, London) pp 119 – 130
Thrift N, 2001, "The machine in the ghost: software writing cities", paper presented to Hegemonies Conference, Centre for Science Studies, Lancaster University, Lancaster; copy available from the author, University Offices, University of Oxford, Oxford
Tolia-Kelly D, 2006, "Mobility/stability: British Asian cultures of 'landscape and Englishness' " *Environment and Planning A* **38** 341 – 358
Tsing A, 2002, "The global situation", in *The Anthropology of Globalization: A Reader* Eds J Inda, R Rosaldo (Blackwell, Oxford) pp 453 – 485
Urry J, 2000 *Sociology Beyond Societies* (Routledge, London)
Urry J, 2002, "The global complexities of September 11th" *Theory, Culture and Society* **19** 57 – 70
Urry J, 2003a *Global Complexity* (Polity, Cambridge)
Urry J, 2003b, "Social networks, travel and talk" *British Journal of Sociology* **54** 155 – 176
Urry J, 2004a, "Small worlds and the new 'social physics'" *Global Networks* **4** 109 – 130
Urry J, 2004b, "The 'system' of automobility" *Theory, Culture and Society* **21** 25 – 39
Van der Veer P, 1995 *Nation and Migration: The Politics of Space in the South Asian Diaspora* (University of Pennsylvania Press, Philadelphia, PA)
Verstraete G, 2004, "Technological frontiers and the politics of mobility in the European Union", in *Uprootings/Regroundings: Questions of Home and Migration* Eds S Ahmed, C Castaneda, AM Fortier, M Sheller (Berg, New York) pp 225 – 250
Verstraete G, Cresswell T (Eds), 2002 *Mobilizing Place, Placing Mobility* (Rodopi, Amsterdam)
Virilio P, 1997 *The Open Sky* (Verso, London)
Watts D, 1999 *Small Worlds* (Princeton, University Press Princeton)
Watts D, 2003 *Six Degrees The Science of a Connected Age* (Heinemann,.London)
Whatmore S, 2002 *Hybrid Geographies: Natures, Cultures, Spaces* (Sage, London)
Wittel A, 2001, "Towards a network sociality" *Theory, Culture and Society* **18** 31 – 50
Wong Y S, 2006, "When there are no pagadas on Pagoda Street: language, mapping, and navigating ambiguities in colonial Singapore" *Environment and Planning A* **38** 325 – 340
Wood D, Graham S, forthcoming, "Permeable boundaries in the software-sorted society: surveillance and the differentiation of mobility", in *Mobile Technologies of the City* Eds M Sheller, J Urry (Routledge, London)