

Introduction

Decentring the object of urban studies

Ignacio Farías

We are perhaps confronting a Tardean moment in urban studies. Myriads of small, lateral and almost peripheral changes, petty movements and subtle displacements are occurring which could suddenly gain momentum and dissipate flows of imitative repetition, radically changing the field. This hasn't yet happened, and its likeliness is something we certainly cannot know, but exploring these micro and subtle displacements can unveil surprising tendencies. Indeed, scholars in urban studies have begun to explore relational, symmetrical and even flat perspectives to make sense of cities, urban phenomena and transformations, thus challenging conventional understandings of their object of study. Even though we certainly can't speak of critical numbers, there have been some remarkable works (particularly Amin and Thrift 2002). These have involved not just a change in the vocabulary, but also the discovery of new settings and new objects of research. The city and the urban do indeed look quite different when explored with symmetrical and radically relational eyes. But how different, something we still cannot fully foresee, is what this collective volume of fresh new works in urban studies attempts to explore.

This volume engages in a much needed exploration in urban studies beyond the strong structuralistic programme still informing the largest portions of the field. It is worrying, to say the least, to ascertain that the last significant theoretical quantum leap in urban studies occurred in the 1970s with the Marxist political economy. This strong programme of urban studies still underlies the most influential approaches and issues in urban research, from global city networks to scalar structuration over notions of a symbolic and a creative economy. Sticking to this rather dated paradigm entails indeed various risks: the risk of taking meta-narratives of structural change for an explanation of urban life; the risk of losing sight of the actual complex and multiple cities we live in; the risk of disconnection from contemporary theoretical developments in social sciences. This volume explores a way out of this 'urban impasse' diagnosed over 15 years ago by Nigel Thrift (1993). It is neither a call for a new form of urban studies nor a reader. It is rather an exploration of the new insights into the city that can be gained if one dares to engage in urban studies with the theoretical tools of contemporary

social science. And a timely question in that context is certainly how Actor-Network Theory (and post-ANT developments and discussions) might change urban studies.

There is also something Heideggerian about this volume, for it is the question itself that is primarily at stake. Consequently, its very terms, the nouns, not the verb, are subject to careful evaluation. In one way or another, most contributors to this volume engage indeed in both an appraisal of the composition, strength and temperament of this actor, ANT, of which it is claimed that it could act upon and even change urban studies, and a less or more critical diagnostic of the current state, conventions and blind spots of urban studies. Thus, this volume is not just the first collective experiment in exploring the city, its urban life, spaces and collectives, with tools provided by ANT, but it is also an experiment in which the collectives compounded, ANT and urban studies, are under scrutiny, being tested and eventually redefined.

Now, before explaining how and why the three parts of this volume were assembled the way they were, I would like to introduce the reader to some of the tools ANT has to offer for urban studies and discuss how ANT can challenge urban studies. The overall challenge – and this should be clear from the outset – affects the stable and bounded way urban studies has mostly conceived the city. The notion of urban assemblages in the plural form offers a powerful foundation to grasp the city anew, as an object which is relentlessly being assembled at concrete sites of urban practice or, to put it differently, as a multiplicity of processes of becoming, affixing sociotechnical networks, hybrid collectives and alternative topologies. From this perspective, the city becomes a difficult and decentred object, which cannot any more be taken for granted as a bounded object, specific context or delimited site. The city is rather an improbable ontological achievement that necessitates an elucidation.

OPENING UP THE ACTOR-NETWORK TOOLBOX FOR URBAN STUDIES

Latour's shifting positions regarding the label Actor-Network Theory, first chopping it into pieces (1999) and then vindicating it (2005), suggest that we are not dealing here with a clearly defined object. Mostly only spelled out letter by letter, ANT is an acronym criticized by many and pragmatically used by many more to rapidly convey a sense of the particular kind of research they are involved in and sometimes even praising. In any case, as soon as the composite 'actor-network' and the notion of 'theory' are articulated together, this is done very carefully and complemented with further definitions of the kind of approach actually meant by that: the study of associations, a symmetrical perspective, a sociotechnical analysis, and so on.

This should make it evident that ANT is less a matter of precise definitions than one of an (allegedly) shared sense regarding the objects researchers

investigate and are curious about, and the kind of studies and discussions they engage in. It would be inaccurate to define it as a theory, for it does not aim at providing explanatory theoretical constructs for any particular state of affairs. It involves rather a certain sensibility towards the active role of non-human actors in the assemblage of the world, towards the relational constitution of objects, and the sense that all this calls for symmetrical explanations. We could add little to what has been already written about ANT's mode of engagement with the world and research (Callon 2001; Latour 2005; Law and Hassard 1999), but let us recall these three central principles: radical relationality, generalized symmetry, and association. 3 pnr
4:

It is well known that what ANT does is in the first place to extend the principle of relationality beyond language (as in de Saussure), beyond culture (as in Lévi-Strauss) and beyond communication (as in Luhmann) to all entities: hence its radicality. Objects, tools, technologies, texts, formulae, institutions and humans are not understood as pertaining to different and incommensurable (semiotic) realms, but as mutually constituting each other (Law 1992). The methodological principle sustaining such radical relationality is called by Michel Callon (1986) the principle of generalized symmetry, which pleads for the use of a common conceptual repertoire to describe and analyse the relations between humans and non-humans. Now, this unveiling of hybrid chains of actants partaking of the social does not aim at deconstructing the social, but at understanding the associations that make up the social. actar The social is thus not a thing, but a type of relation or, better, associations between things which are not social by themselves (Latour 2005). These three general principles also act as mediators to wider strands of theory and research providing for constant overflows. ANT emerges thus as an imbroglio of theories, concepts and studies constantly being framed, overflowed and reframed. As a sensibility towards research and the world, it shouldn't surprise anyone to discover that through and behind ANT multiple theoretical fibres act surreptitiously, pushing this reshaping of urban studies sometimes in quite different directions. One should then ask: which are the materials, workers, contractors, machines and engineers of this 'open building site' (Callon 2001: 65) called ANT that are particularly relevant for reshaping urban studies?

One should first state that the featuring of the active role of non-humans has allowed ANT to establish multiple connections and even to enrol and canalize different traditions within the field of science and technology studies (STS). Paying attention to these interconnections is particularly crucial, for indeed the understanding of cities as sociotechnical systems and enormous artefacts was initially developed by historians and sociologists of technology researching Large Technological Systems (Coutard 1999; Hughes 1983; Summerton 1994) and the Social Construction of Technology (Pinch and Bijker 1984). Two influential examples of these are Thomas Hughes's (1983) study of electrification in the Western metropolis and Aibar and Bijker's (1997) study of town planning, both as technologies differently framed and

negotiated by different groups of actors, articulating material and social components of the city simultaneously.

The articulation of these perspectives with an ANT perspective on cities was indeed a major endeavour of Graham and Marvin's celebrated book *Splintering Urbanism* (2001). Indeed, their basic understanding of the city as a process of assembling together technical and social aspects remains being a major theoretical fibre informing ANT studies of the urban, even after Coutard and Guy's (2007) fair critique of a soft form of technological determinism expressed in its universal alarmism. The latest studies presented by Graham have shown the enormous potential of this approach to unveil urban processes otherwise overlooked in urban studies. His work on strategies of urban warfare has patently shown that urban infrastructures are a life-or-death matter for cities and citizens (Graham 2005, 2006a, 2006b). As highly political as the latter is the issue of urban maintenance and repair taken up by Graham together with Thrift (2007). Particularly the interconnection between a politics of maintenance and repair and economic cycles of acquisition and disposal has become today a major subject of geopolitical struggles and environmental politics.

Besides featuring the city as a 'mecosphere' (Amin and Thrift 2002: 78), ANT encourages and offers tools to the urban scholar for studying and reflecting on the architectural and built environment of cities and its production. Indeed, a particularly noticeable development is the enormous growth of ANT-inspired studies of architectural practice. David Brain (1994) was probably the first to feature architects as engineer-sociologists making sense with things. Also Michel Callon's (1996) little-known reflections on architectural work of conception and projection have been crucial in originating a new strand of research on the work of 'heterogeneous engineering' (Law 1987, 1992) conducted in architects' studios and the role of physical models, perspective drawing, 3-D design computer programs and the like (Houdart 2006; Yaneva 2005a, 2005b, 2008). Gina Neff and colleagues' (2009) current research and findings on cognitive dissonance and uneasy collaboration among architects, builders and engineers triggered by virtual 3-D models of buildings shows from yet another perspective that buildings are not static objects, but 'moving projects' (Latour and Yaneva 2008), which certainly do not stop moving when built. The work of Simon Guy, Ola Söderström, Ralf Brand and others emphasizes also this latter point. The dynamic co-evolution of the built environment and society is at the core of their innovative works on issues such as sustainable architecture (Guy and Moore 2005), sustainable mobility (Brand 2008) and the mediatory role of the built environment.

Only one small step separates all these intellectual strands acting through ANT from a notion of 'cyborg urbanization' (Gandy 2005) which in recent years has often been heard in urban studies (an early example is Swyngedouw 1996). Despite some slightly technology-driven uses of it (Mitchell 1998, 2003), this notion introduces two further nuances on what it means to look at

the city through the eyes of ANT. Indeed, at least since Donna Haraway's (1985) 'A Manifesto for Cyborgs' was published, the notion of this cyborg as a 'hybrid creature composed of organism and machine' (1985: 1) involves primarily a challenge for common notions of human 'nature'. Consequently, 'cyborg urbanization' displaces the focus of attention from the city as a sociotechnical system and enormous apparatus to these hybrid forms of being human, of shaping an urban public sphere and experiencing the city through technological networks and life-supporting systems. Rob Shields' (2006) discussion of 'Flânerie for Cyborgs' suggests that the cyborg is not simply defined as a body with prostheses, but, like the flâneur, it emerges relationally at concrete sites of action, such as home, market, workplaces, states, schools, hospitals, churches and electronic spaces like the web. Cities thus constitute particularly intensive places of cyborgization, in which multiple cyborgian existences and practices are bundled together. Regarding a cyborgian urban public realm, Girard and Stark's (2006) research on the socio-technologies of public assembly in New York City after 9/11 is quite suggestive, for it shows that urban publics are enabled by the multiple sociotechnical set-ups necessary for sensing and experiencing, sense-making and imagining, and taking action and demonstrating, rather than a public dialogical urban sphere.

The second avenue of study and reflection opened by this notion of 'cyborg urbanization' involves the role of urban natures and the political ecologies of cities. ANT's stress on the agency of natures, ecologies and even ethologies, which can classically be brought back to Latour's (1988) and Callon's (1986) studies of microbes and scallops, respectively, has not just inspired scholars to look at urban natures, but also allowed for multiple connections and allies inside and outside the urban studies world. A pioneer in this field is certainly Erik Swyngedouw (1997; Swyngedouw and Heynen 2003), who has devoted years to investigating the political ecology of cities and its complex relations with urbanization, modernization, politics of scale, social justice and other central issues in urban studies. Another interesting forebear is William Cronon's study (1991) of the natural causation of Chicago's path of development, which has become a praised masterwork also by ANT scholars for explaining the progressive composition of a metropolis without invoking the agency of social contexts and other phantasmagorical agents. Yet another case in point is Manuel DeLanda's (2000) history and philosophy of the integral part played by geological and biological processes in the history of the world and particularly of cities. Now, and coming back to the issue of the public assemblies mentioned above, all these elements make particularly urgent the question of whether and how a parliament of things and life forms is possible (Latour 2004). This hasn't been discussed in urban studies, but a good starting point could be found in some of the newest discussions in legal studies about the rights of non-humans (Teubner 2006).

All this said, one should note that ANT involves more than an opening towards dimensions and agents otherwise not considered in urban studies. Its

fervent anti-structuralist position, as well as its strong empirical commitment to actual sites and lines of activity, converts it into a major challenge for otherwise widely used and accepted distinctions, neo-Marxist structuralist narratives and explanatory models at work here. This affects sensible issues in urban studies, such as the production of space or the dynamics of urban economies. Indeed, ANT provides a radical account of space and time as consequences, effects or, even, dependent variables of the relations and associations making up actor-networks. From this perspective, space is not an underlying structure produced by capital relations (Smith 1992) or state strategies (Brenner 2004) or whatsoever. Thinking space and scale as a product which somehow becomes independent from the set of practices that produced it (what structuration ultimately means) would involve falling into the trap of fetishism, in the Marxian sense of taking for real and ontologically autonomous what is rather an attribute of particular actor-networks and urban sites. Space, scale and time are rather multiply enacted and assembled at concrete local sites, where concrete actors shape time-space dynamics in various ways, producing thereby different geographies of associations.

Probably the most notable example of this empirical commitment with actual and concrete urban sites is Latour and Emile Hermant's mosaic *Paris ville invisible* (1998). This book shows that Paris exists in no one space or scale, but is differently enacted at multiple sites. Space, time and the city itself are produced or, better, emerge thus in ways conditioned by the types and extension of the actor-networks operating at these local sites. In this manner ANT destabilizes the autonomy and explanatory priority attributed to space in urban studies, substituting the key notion of sites in plural for it. Sites are defined not by spatial boundaries or scales, but by types and lines of activity, and spaces emerge through the networks connecting different sites (Latour 2005). Thus, while ANT becomes a loosely coupled medium through which post-structuralist (especially Foucault) and non-representationalist (Thrift 2007) notions of space affect urban studies, all these challenge and object to commonly invoked spatial formations in urban studies, be these a globally operating neoliberal economy or locally integrated urban clusters of production.

As this suggests, ANT also involves providing new insights into the dynamics of urban economies. The move in ANT towards the study of economy occurred mainly through Callon's (1998) pioneering examination of the performativity of economics and the resulting challenge to the classical 'new economic sociology' (Swedberg 1997). Economic action, argued Callon (1998), is not embedded in social networks (which the urban sociology and economic geography gladly understood as settled in urban spatial clusters), but it is framed activity which in order to occur requires rather its disentangling from the social. Thus, if economic action is embedded in anything, it is in economics which through knowledge and devices performs market activity. This approach transforms economic anthropology and sociology in such fundamental ways that it necessitates a new approach on the economies of

cities beyond the embeddedness paradigm (Granovetter 1985; Zukin and DiMaggio 1990) informing discussions on global cities (Sassen 2005), the creative economy (Florida 2002) and the like. Such a new take has been notoriously attempted by Ash Amin and Nigel Thrift. In *Cities* (2002) they proposed a major shift in the consideration of the economic role of cities. The idea that production clusters obtain competitive advantages from their local environment is questioned and with it the notion of cities as units of economic production. The economic role of cities would rather reside in their demand effects. A new 'post-institutionalist' take on urban institutions is thus implemented that emphasizes their role as instances for demand agglomeration, not regulatory machines.

ANT's reshaping of our view of urban infrastructures, built environments, ecologies, urbanites, practices, spaces, economies and other central issues of urban studies ultimately involves an empirical and philosophical investigation into the ontological status of cities. Indeed, even though ANT started out studying the fabrication of knowledge in laboratories, and was thus at the crux of the 'science wars', ANT wasn't simply about recasting the epistemological status of scientific knowledge, but about understanding the production of such knowledge as a praxis-grounded ontological achievement. Seen in these terms, to argue that it is the ontological status of cities that is at stake here doesn't imply subscribing to the idea that only in recent days would a turn to ontology in STS be taking place (Woolgar *et al.* 2008). At least Bruno Latour's intellectual project has always been about 'the systematic comparison of the modes of existence' (2008: 9), such as science, technology, religion, law or politics, that make up the 'infraphysics of Europe, or regional ontology (depending on how we want to call it)' (2008: 9). And this is not new. Ten years ago Latour (1999) famously referred to Michael Lynch's suggestion that ANT should be really called 'actant-rhizome ontology', a horrible but accurate term, which makes evident the Deleuzian framework in which ANT operates. Indeed, ANT shares some central features of Deleuzian metaphysics, such as the Bergsonian notion (Deleuze 1988) that reality is qualitative multiplicity, to which I will come back in the next section. Beyond that, ANT makes out of Deleuze's philosophy of creation an empirical project focused on the generative capacities of actor-networks and the new entities (objects, technologies, truths, economic actors) and dimensions (times, spaces) brought into being.

One could go on and on and point to further intellectual strands and academic traditions acting and passing through ANT, noting how each of them decentres urban theory and research in different ways. But for the moment it might suffice to make clear that ANT entails an imbroglio of theories, authors, questions and sensibilities, which can't be strictly used as a theory of anything. This ANT-inian imbroglio we just started to open up provides rather a useful and plastic toolbox for urban studies, a broad pool of perspectives for questioning cities in new ways. What all these perspectives have to offer is a rich theoretical ground to develop radically relational and

symmetrical understandings of the city: challenging distinctions between global and local, close and far, inside and outside, notions of place, proximity and boundedness, ceasing to attribute priority to socio-cultural symbols, structures or practices over urban natures and technological infrastructures, radically rethinking the basis of urban power and knowledge and the notion of urban regimes and so on. Thus, opening the actor-network toolbox for urban studies entails not only a new way of posing research questions, but also new ways of doing research in the city. And it provides too a new interdisciplinary space for the interplay of the social sciences and the humanities.

But this certainly isn't an easy task, not least because there are no templates that one could mechanically transport into urban studies. Indeed, many of the rich resources ANT places at the disposal of the urbanist should be first disentangled from the sophisticated sociotechnical settings in which they were originally developed and translated into the urban realm: a broader context, less spectacular than a lab or a trading floor, but much more or very differently complex. The translation as creative and transformative process is indeed the key; for transformed gets not just ANT, but also the very field of urban studies. Indeed, the advancement this volume involves, namely, to explore how ANT might change urban studies and how the city is to be thought after accepting the challenge of ANT, comprises not only attesting the composition and strength of ANT, but engaging also in a critical appraisal of urban studies.

URBAN ASSEMBLAGES; OR DECENTRING THE OBJECT OF URBAN STUDIES

If there is an overall challenge ANT poses to urban studies, it does not consist simply of the partial displacements and subtle changes we identified above. There is indeed no necessity to think that highlighting the sociotechnical composition of cities should be more challenging than flat conceptions of space, or that cyborgian understandings of urbanites are more groundbreaking than questioning the urban embeddedness of economic production. All these emphases involve indeed suggestive avenues of research introducing new discussions and dimensions into the field, but they can't by themselves challenge urban studies as a whole. Rather we need to identify fundamental displacements transforming the very ground of urban studies, affecting the very way cities as objects of research are conceived. And, indeed, if the ontological stance of ANT should be credited for any one particular thing, this should be the immense ethnographic accuracy and analytical sophistication to follow and conceptualize objects. This started, indeed, very early with Latour and Woolgar's (1986) ascertainment of immutable mobiles: objects that despite their displacement in Euclidean space maintain a stable position and remain immutable in network space (see also Law 1986). And the latest developments in (post-)ANT are also associated with an examination of

challenging objects, be they fluid technologies (de Laet and Mol 2000) or multiple bodies (Mol 2002).

Such 'object lessons' (Law and Singleton 2005) might be of high relevance for urban studies, for even when conceptualizations of 'the city' might vary a great deal in the details, they remain rather monolithic in the assumption that cities (should) involve some stability of shape, that cities are spatial formations, socioeconomic entities or sites for action or culture that can (should) be positively identified and distinctly delimited. Indeed, the obduracy of conceptions of the city in the field is striking. Since the early attempts of sociologists, historians, economists and urban planners to develop a field of urban studies, the reality of the city has been understood in highly stable and bounded ways. While much of contemporary research has revealed and explored the relational or processual aspects of city life, in most of the cases the city is understood as 'one' entity that can be identified, observed and investigated across multiple contexts of representation and practice. Indeed, what often seem to be radically new ways of imagining cities and their contemporary transformations, highlighting for example connections overcoming urban boundaries or critically assessing socioeconomic divisions, are in most cases pretty much framed in the same old schemes. The result is thus a binary: cities are bounded or fragmented, singular or dual, one or many.

There are at least three major understandings of the city that can be traced back to the early days and that still inform urban research today without much change. In a nutshell, these involve understanding cities as spatial forms, as economic units and as cultural formations. These are, of course, not alternative views, and indeed it is difficult to imagine any interesting urban research not building upon multiple connections between these three and other dimensions. For analytical purposes it is however useful to disentangle these basic understandings to explore the extent to which they converge in the assumption that cities constitute bounded or stable entities, be these spatial, economic or cultural.

So let's briefly rehearse some well-known arguments. The ecological approach to the city brought forward by the Chicago School provided a quite sophisticated spatial understanding of the city, urban life and dynamics of urban growth. The basic premise in the work of Burgess (1925), McKenzie (1926) and, to a lesser extent, Park (1952) was that cities constitute a definite spatial environment within which the human urban community settles down in discernible sociospatial patterns as a result of ecological processes, such as competition for location, invasion, successions and so on. This perspective contributed with crucial concepts and insights to the relationships between neighbourhoods, socioeconomic structure and segregation, the dynamics of real-state markets and other urban phenomena. It also provided the ground for the trade-off approach, social area analysis and other perspectives aimed at understanding the internal spatial dynamics and differentiation of cities as a result of social and economic forces. But barring the arrays of very sophisticated models developed in this line, what this perspective brings to the fore

- Chicago School - city as spatial env.

is a pervading understanding of cities as spatial units, as spatially delimited places. One could argue that it was precisely the primacy of such a commonsensical notion of cities that especially in the 1980s made so interesting and attractive the study of urban formations that challenged the idea of bounded spaces (Fishman 1987; Garreau 1991). Edward Soja's notion of *Postmetropolis* (1997, 2000) is a good case in point, for when it gets to its spatial features he speaks of a spread of 'exopolis':

Some have called these amorphous implosions of archaic suburbia 'Outer Cities' or 'Edge Cities'; others dub them 'Technopoles', 'Technoburbs', 'Silicon Landscapes', 'Postsuburbia', 'Metroplex'. I will name them, collectively, *Exopolis*, the city without, to stress their oxymoronic ambiguity, their city-full non-cityness. These are not only exocities, orbiting outside, they are ex-cities as well, no longer what the city used to be.

(Soja 1996: 238–9)

Interestingly, this direct contraposition of exopolis to the notion of a bounded city is possible because both, city and exopolis, metropolis and postmetropolis, are being primarily imagined as objects in Euclidean and geometrical space.

Another tradition of urban studies, which can be traced back to the classical works of Max Weber (1986) on the role of cities for capitalism, understands the city as an economic unit, sometimes even as an economic actor, which involves particular forms of government and urban regimes. From early on, this notion became highly influential, especially as it was complemented with larger geographical perspectives that understood cities as economic entities competing within larger systems of cities. Walter Christaller's (1933) central place theory, for example, explained size, location and economic development and specialization of cities with a pioneering network model that weighed up the quality of the node ('threshold') and of its ties ('range'). Indeed, a great part of the literature on the contemporary in inter-urban competition, urban systems, global cities and more recently also creative cities is keyed upon this understanding of cities as economic actors, entities that act. Peter Marcuse (2006) has recently pointed to the hidden contents of such notions:

a city does not compete for the Olympics, certain groups within it do, others often object mightily. This idea of the city as an actor is perhaps the most politically loaded . . . [of] usages, for it implies a harmony of interests within the city; what's good for one (generally the business community) is good for all.

(Marcuse 2006: 3)

As Marcuse notes, this usage is not just common in political talk. Saskia Sassen and other authors discussing globalization and cities sometimes slip too into this usage: 'cities will become the major actors in the new global

economy' (Sassen 1991: 14). The city emerges here as a different type of object, not a spatial one, but a network object, which holds its shape and position as a consequence of its relations with other network objects.

The problem with describing cities as global, informational or creative entities is that of synecdoche, that is, taking a part of an object to be the object (Amin and Graham 1997). Now, interestingly, the right avoidance of synecdoches and the politically correct ascertainment of differences between the parts often lead to the collapse of the object. The notions of 'dual city' (Mollenkopf and Castells 1991) and 'divided city' (Fainstein *et al.* 1992) have been used since the 1980s to highlight the intensification of social polarization in cities. Even though these notions were intensively discussed and criticized for being a simplistic analytical construct – the rich and the poor, the global and the local, etc. – the alternatives suggested, such as the fragmented city or the quartered city, even though they involve a more specific analysis of sociospatial polarization, share the basic idea of a divided city: here, again, urban theory runs into the same Hamletian dilemma we pointed out above: if the city is not to be conceived as one political-economic actor, it is imagined as not holding together. Marcuse is in this regard quite clear: 'you don't get one thing, a "city", when you put all [interest] groups together' (2006: 5). The city, it seems, can be one or simply not be.

A third major line of reflection on cities goes back to Georg Simmel's (1903) groundbreaking essay on the mental life of big-city dwellers, Robert Park's (1925, 1929) understanding of the city as a state of mind and Louis Wirth's (1938) definition of urbanity as a way of life. In the foreground here is a conception of the city as culture – anonymous, vertiginous, public – and a claim for an ethnographic study of its various manifestations. Urban culture is seen thus as what constitutes the city:

Much of what we ordinarily regard as the city – its charters, formal organisation, buildings, street railways, and so forth . . . become[s] part of the living city only when, and in so far as, through use and wont they connect themselves, like a tool in the hand of man, with the vital forces resident in individuals and in the community.

(Park 1925: 3)

Understanding the city as a product of human nature and, particularly, of human culture necessitates thus the investigation of the customs, beliefs, social practices and general conceptions of life prevalent among its inhabitants. In the tradition of the Chicago School, neighbourhoods provided the key analytical unit to follow different manifestations of urban culture. Urban culture appears here as the underlying common ground connecting different urban niches, ethnic groups and moral areas. In the tradition of everyday urbanism associated with such authors as Henri Lefebvre (1991), Michel de Certeau (1988) and Manuel Delgado (2007), urban culture is looked for and studied in the ubiquitous spaces of the urban everyday. In this context,

culture is not invoked to understand how the city holds together despite its internal differentiation, but to understand the urban as a process of dissemination, transformation and even revolution. Urban culture is not just a 'state' of mind or 'a' way of life manifesting itself in slightly different ways in different urban areas, but involves a creative movement and uncontrollable spaces in between urban areas. Urban culture is recognized here in residual and transient spaces which are seen as even opposed to 'the' city made of bounded places, fixed meaning and big history.

Looking at cities as culture raises the same type of dilemmas we observe above for spatial and economic understandings of cities. The problem lies in the stability of the object. As cultural formations, cities are imagined as fluid objects that remain identical despite slight variations from case to case. They are fluid, for their manifestations vary, but keep their shape and identity. Thus, while it is possible to look at many lively Euro-American cities as resembling expressions of a fluid urban culture, as soon as differences go too far between and within cities, one is confronted with the paradox of cities to which an urban culture cannot be ascribed. And this is precisely the dilemma: understood as fluid cultural objects cities are either the locus of a fluid urban culture or they are not. Seen in this way, it is not surprising that authors writing in the tradition of everyday urbanism point to a profound gap between the city and the urban life. Building on de Certeau and Lefebvre, Delgado (2007) retrieves a generative notion of non-city in order to grasp the relentless urban dissemination of creative practices and transient spaces. The non-city, not to be confused with the negativity of Marc Augé's (1995) account of 'non-places', is about pedestrian tactics, street choreographies, indifference, anonymity and other features that define urban culture:

What constitutes the city is . . . a non-city which is not the opposite to the city . . . but a perpetual unmaking of what is already made, and a ceaseless remaking of what we saw disintegrating in front of our eyes.

(Delgado 2007: 63, transl. IF)

From this perspective, it is not just that urban culture cannot be predicated of all cities, but that it constitutes a vital force that cannot be fixed and stabilized in any notion of city.

This rough summary is certainly very basic and incomplete and one could fairly object to the gross separation of spatial, economic and cultural dimensions and to some of the implied generalizations. The field is more complex than this and we know it. But, at the same time, one should concede that it catches fundamental notions of important strands of urban thinking enabling thus a fair critique, namely, that the city has been mostly thought of as a bounded unit and a stable object: a spatial form, an economic-political entity, a cultural formation. Moreover, insights and concepts critically developed to question this idea of 'a' city haven't effected any fundamental

transformations, for they too rapidly move to the other side of the binary: the city exists or not; it is one or many. While notions of exopolis, divided cities and non-cityness do the work of rejecting the idea of 'a' singular and integrative city, they make the object implode. The mere ascertainment of profound sociospatial polarization and insurmountable gaps between urban culture and the city does not lead to a renovated understanding of the city as an object, but often to a renouncing.

The main contribution that the ANT approach has to offer lies ultimately in the delineation of an alternative ontology for the city, an alternative understanding of this messy and elusive object. Such an alternative ontology can here only commence to be imagined. However, three central principles or notions strike as impregnable. Firstly, the city's mode of existence resembles less a notion of 'out-thereness' than one of 'in-hereness'. This principle is derived from John Law's (2004) discussion of the realistic assumptions of social science methods, which have involved understanding objects as entities independent and even prior to our actions, with definite boundaries and constituted within a singular shared reality. Law shows that from early on ANT has involved countering this metaphysics of presence by looking at how objects are being made and unmade at particular sites of practices. Even 'out-thereness' is crafted and produced 'in here', as enormous effort is put into making objects achieve independency and anteriority, and representational practices are involved in producing definiteness. It follows from that discussion that cities are a variable product of concrete practices, constructed *in situ*, in here. A second major point is that the city is not socially constructed, but enacted into being in networks of bodies, materialities, technologies, objects, natures and humans! Bruno Latour (2003) has pointed out that underlying the notion of construction is the assumption of a powerful creator, such as society, structure, culture, discourse, constructing and creating *ex nihilo*. Moreover, since the construction of reality is mostly understood in epistemological terms, the materials and intermediaries involved in the construction are deprived of any active role. This is certainly not how we should imagine the city being locally constituted. Annemarie Mol's (2002) notion of enactment is much more accurate in understanding how objects are brought into being. Similar to the notion of performance (of subjects), the enactment of objects, such as the city, is not just social, but also material, and involves the heterogeneous ecologies of entities acting at sites and contexts of practice.

The principle that follows from this is that the city is a multiple object. This suggestion is, of course, based on Mol's (2002) groundbreaking book *The Body Multiple*, where she suggests that differences in the ways an object (such as a body) is enacted at different moments and sites are not to be understood epistemologically as different perspectives on the object, but ontologically, acknowledging that different realities are being enacted here and there, now and then. This understanding touches upon the Bergsonian assertion of the multiplicity of reality. For Bergson (Deleuze 1988) multiplicity results from

city — not a stable object

the temporal or better durational nature of the real, for it is this temporal dimension that makes potential possibilities and virtual tendencies into a constitutive aspect of the object. Through time and space the same object proves to be multiple. And if this applies to a body moving within a hospital, it certainly applies to cities being enacted in multiple different ways at different sites and times. This feature of the city is also stressed by Amin and Thrift, when they suggest that

the city is made up of potential and actual entities/associations/togetherness . . . The accumulation of these entities can produce new becomings – because they encounter each other in so many ways, because they can be apprehended in so many ways, and because they exhibit ‘conrescence’.

(Amin and Thrift 2002: 27)

Conrescence means here that the encounters and associations of urban entities produce emergent urban realities and that becoming is an emergent process. Now, what is interesting is that these multiple enactments or multiple becomings are not understood as fluidly following from each other, but as discontinuous, even contradictory and mutually exclusive. As Mol (2002) suggests, they collide with each other, overlap, interfere, and form thereby a multiplicity that has to be managed, coordinated or even held apart. Understanding the city as a multiple object involves thus a major challenge for urban research: identifying, describing and analysing these multiple enactments of the city and understanding how they are articulated, concealed, exposed, and made present or absent (cf. Law and Singleton 2005).

The notion of urban assemblages in the plural form provides an adequate conceptual tool to grasp the city as a multiple object, to convey a sense of its multiple enactments. There are many reasons for using this notion. Firstly, it is a term that provides a concrete and graspable image of how the city is brought into being and made present in ensembles of heterogeneous actors, material and social aspects. This idea of a sociomaterial and sociotechnical ensemble is the most literal meaning of assemblage. It is, indeed, a rather imprecise translation of Deleuze and Guattari’s (1981) notion of *agencement*, a quite common term in French for the arrangement or fitting together of different elements (Phillips 2006). Correspondingly, it allows and encourages the study of the heterogeneous connections between objects, spaces, materials, machines, bodies, subjectivities, symbols, formulas and so on that ‘assemble’ the city in multiple ways: as a tourist city, as a transport system, as a playground for skateboarders and free-runners (‘parkour’), as a landscape of power, as a public stage for political action and demonstration, as a no-go area, as a festival, as a surveillance area, as a socialization space, as a private memory, as a creative milieu, as a huge surface for graffiti and street-artists, as a consumer market, as a jurisdiction etc. As Marcus and Saka have pointed

out, the notion of assemblage becomes thus 'the major thrust' of social and cultural theory to focus on the 'always-emergent conditions of the present' (Marcus and Saka 2006: 101–2). It makes possible a double emphasis: on the material, actual and assembled, but also on the emergent, the processual and the multiple.

The emergent constitution of urban assemblages suggests indeed that they are not to be understood as results of the mere encounter or sum of multiple elements. Attending to the shared etymological root of *agencement* and agency, one should note that urban assemblages enable new types of activity and agency (Muniesa *et al.* 2007). Agency is thus an emergent capacity of assemblages. We move thus towards a second notion of urban assemblages. As DeLanda (2006) points out, *agencements* or assemblages are to be thought of in terms of relations of exteriority. This means that the relations between heterogeneous elements, out of which an urban assemblage is made, do not necessarily alter the identity of each of the particular elements. A tourist urban assemblage might well require the concurrence of political buildings, art galleries or public bus routes and not necessarily alter any of these particular entities. Assemblages do not form wholes or totalities, in which every part is defined by the whole, but rather emergent events or becomings. Urban assemblages designate thus the processes through which the city becomes a real-state market, a filmic scene, a place of memory; it is the action or the force that leads to one particular enactment of the city. It is interesting to notice that Bruno Latour (2005) does not use the noun 'assemblage', but the verb 'assembling' to understand how the social comes together through associations between human and non-human elements. The social, the assembling process, is external to these actants, which do not become social, but remain human, material, technological and biological. Similarly, the notion of urban assemblages understands that the urban is an emergent quality of the multiple assemblage process, which is not pre-existent in the streets, the buildings, the people, the maps etc. The city is thus not an out-there reality, but is literally made of urban assemblages, through which it can come into being in multiple ways.

As with the notion of 'global assemblages' introduced by Collier and Ong (2004), the plural is also crucial. The global, they observe, involves abstract forms, such as a market calculation, which are actualized in complex infra-structural conditions. The global is always thus an actual global. And this actual global is plural. It does not produce similar effects everywhere and its functioning and meaning might greatly vary depending on the multiple determinations of its assemblages. In our terms, the global is multiple, and this multiplicity results from the tension between the virtual and the actual. The actual city, as the global, exists only in concrete assemblages and provides no encompassing form for its multiple enactments. The city is thus a contingent, situated, partial and heterogeneous achievement: an ontological achievement, indeed, as it involves the enactment of an object otherwise inexistent.

←
assemblage = fitting together of diff elem

THE ASSEMBLAGE OF URBAN ASSEMBLAGES

Every book, every object, every project has multiple points of origin. One has to choose some of them to tell stories. In the case of this book an important one was 5 October 2006 at the International Affairs Buildings of Columbia University, where the Center for Metropolitan Studies of Berlin (CMS), to which I was affiliated as a DFG doctoral candidate, was hosting its first conference in New York City. One of the CMS's New York-based board members, Thomas Bender, Professor of History at New York University, provided the opening keynote lecture. To my surprise, in his talk he discussed in detail the different kinds of challenges Actor-Network Theory poses to urban history and urban studies. After that conference Tom and I decided to organize an international workshop on what we called 'Urban Ontologies: Importing ANT into Urban Studies', which took place in May 2007 at the offices of the CMS in Berlin. Even though only a handful of authors contributing to this volume participated in that workshop, the presentations, discussions and exchange among participants made evident that we were not just experimenting with highly interesting perspectives and vocabularies, but entering a whole new field. Later that year, during my three-month stay at NYU, we confronted the real proof of fire: problematizing the lack of connections between ANT and urban studies. We looked for and then enrolled other colleagues interested in joining our enterprise, and we identified a series, series editors, an editor in Andrew Mould, and a press in Routledge that was supportive of our effort. It was a difficult and paradoxical process, for it involved a non-existing object about which our friends and colleagues, six anonymous reviewers (whom we want to sincerely thank) and many other actors seemed to have a lot to say. Perhaps the most decisive moment, before the project became an immutable mobile, occurred one year later with both Tom and me seated at a table on the loud and sunny terrace of the Social Science Building of the Universidad Diego Portales in Santiago de Chile. There we finally began to figure out what this whole book was to be about, from the issues and the structure to the right tone and style.

This story is not just an ingratiating way to thank all the institutions that supported us; it aims rather to highlight the unique geographical trajectory through which this book came into existence. Indeed, Berlin, New York and Santiago de Chile do not count among the major sites for the discussion, enhancement and transformation of ANT. This is a book mostly written at the borderlands of ANT with authors working in eight countries from three continents and writing on case studies from many more places. And this is something clearly reflected in the articles of the book, which do not represent any internal debate within ANT, but seek to open up fresh approaches and new avenues of interdisciplinary research more generally. Written at the boundary between urban studies and ANT, it is also aimed at a broad audience.

The book is structured in three main parts. Each of these seeks to illuminate a different kind of challenge for urban studies and provide new research questions, new subject matters and new vocabularies. The contributions selected for each of these parts have been chosen strategically to illuminate different topics particularly relevant in contemporary urban studies. The chapters are mostly research oriented and exemplary in character. They do not seek to elaborate ultimate positions on any of these issues or represent theoretical discussions. The research chapters of each part are followed by one interview with a leading scholar, whose work partly frames the orientation of that part. Since the 'translation' of actor-network tools into the field of urban studies is being developed in an almost experimental mode, this book has a prospective rather than a retrospective nature. It takes the risk of reflecting on new strands influencing urban studies and it seeks, thereby, to set a new research agenda.

The first part, 'Towards a flat ontology?', offers rich empirical materials and incisive discussions on the spatial and scalar configuration of urban assemblages. Distinctions between the local and the global, small and large, as well as forms of spatial agglomeration, are rendered here into emergent qualities of urban assemblages. Scalar structuration and clustering are rejected as underlying structural processes and consequently as analytical categories for the study of cities. Instead this part moves towards a relational understanding of spatial formations, which doesn't take away space from actors, as though it would exist out there independently, but imagines space (and eventually scale) as fields of activity or better as attributes of certain urban assemblages. It is at this point that the question 'What does it mean for urban studies to take a flat perspective?' becomes crucial. In Chapter 1, 'Gelleable spaces, eventful geographies: the case of Santiago's experimental music scene', Manuel Tironi provides major insights for reimagining the stability of the sociospatial formations of creative scenes, beyond the bounded notions of space informing most studies of creative production. Neither spatial proximity nor spatial fixity hold together the artistic scene under Tironi's scrutiny, but its capacity to spatially and organizationally gel, couple and decouple through its emergent eventuality. In Chapter 2, 'Globalizations big and small: notes on urban studies, Actor-Network Theory, and geographical scale', Alan Latham and Derek P. McCormack explore the usefulness of a notion of spatial flatness by contrasting the kind of account it provides of globalization with an account based on the idea that the world is intrinsically hierarchical and scalar. By looking at the recent history of mass urban sporting events they argue that flat perspectives do not involve getting rid of scales, but redefining them as the assemblage of extensive attributes. In Chapter 3, though, entitled 'Urban studies without "scale": localizing the global through Singapore', Richard G. Smith draws on his research on the restructuring of Singapore's legal services to argue that, through being attentive to how actors define situations and networks (or work-nets) in their terms, using their own dimensions and touchstones (rather than those of the social

scientist), it is clear that scalar processes do not exist and consequently should not be invoked to try to explain, for example, how Singapore is participating in the global economy. But what if actors themselves engage in scaling practices based on notions of the global and the local? In Chapter 4, 'Assembling Asturias: scaling devices and cultural leverage', Don Slater and Tomas Ariztía present a rich case study on the assembling of social scales. Closely following the scaling practices and devices put in action by governmental agencies, an international cultural centre, local youth, and themselves as researchers, they unveil how 'fudging' regarding what is meant by 'local', 'global', 'culture' and so on is crucial for attempts at 'leveraging' Asturias into the global circuit of culture. This part closes with an interview with Professor Nigel Thrift, Vice-Chancellor of the University of Warwick. Thrift is one of the most influential scholars in the field of human geography and has led the way for the incorporation of non-representational theories, especially ANT, into the field of urban studies.

A number of explorations into 'A non-human urban ecology' build the core of the second part. While the ascription of an active role to non-human aspects of the city is a well-accepted point in urban studies, it is still rather difficult to find good examples and analyses that successfully both avoid asymmetrical explanations, whether technological determinism or social constructivism, and also engage with urban issues and processes. This second part gathers exceptional works that vividly show that cities and urban life involve a hybrid ecology of natural, material, mechanical and technological elements. They assess the architectures, infrastructures and even sound technologies as key pieces ensuring the stability and change of urban assemblages. In this way, this part opens up the study of the non-human ecology of the city to otherwise overlooked objects and actants. In Chapter 5, 'How do we co-produce urban transport systems and the city? The case of Transmilenio and Bogotá', Andrés Valderrama Pineda takes on a rather classical object for sociotechnical studies of the city, the design and implementation of a transport system, and carefully shows to what extent design decisions regarding particular elements of new transport systems, such as buses or bus stations, were and still are entangled with the physical reorganization of the city and thus in the lived experience of citizens. Anique Hommels explores in Chapter 6, 'Changing obdurate urban objects: the attempts to reconstruct the highway through Maastricht', the far-reaching consequences of such co-productions and the stubbornness and immutability of urban infrastructures once in place, anchored in their own history. Her chapter studies the attempts to reconstruct the highway that cuts through the Dutch city of Maastricht, which from the late 1950s until today (2009) remain unfruitful, and explores the strengths and limitations of three models of obduracy: dominant frames, embeddedness and persistent traditions. But the non-human ecology of the city, particularly its built environment, changes much more rapidly and in much more contingent, flexible and plastic ways than often thought. In Chapter 7, 'Mutable immobiles: building conversion as a problem of quasi-

technologies', Michael Guggenheim explores precisely the obduracy and plasticity of buildings and the extent to which they can be considered technologies. His rich fieldwork focusing on legal controversies on change of use suggests that buildings are neither technologies nor objects, but quasi-technological mutable immobiles. In Chapter 8, 'Conviction and commotion: on soundspheres, technopolitics and urban spaces', Israel Rodríguez Giralt, Daniel López Gómez and Noel García López study the effects of sound technologies in the production of urban spaces as a particular sort of technopolitics, looking especially at how collectivities get ordered and organized by two strategies or logics of sound space modulation: a logic of conviction and a logic of commotion. This second part concludes with an interview with Stephen Graham, Professor of Geography at Durham University. His work on urban technological infrastructures has had a major impact in the field of urban studies, contributing powerfully to the move from humanistic understandings of cities towards sociotechnical perspectives.

The third part, entitled 'The multiple city', stresses the plurality of urban collectives populating, circulating in and constituting the urban public sphere, questioning thereby the possibility of an all-encompassing urban assembly. When looked at in detail, as the chapters in this part do, the public spaces and spheres of the city reveal themselves indeed to be plural and to put into play different cities. The city is literally multiple different things, has multiple different forms, gathers multiple different publics, fulfils multiple different functions, triggers multiple different practices, and so on. The public urban sphere is not a singular realm for citizen negotiation of access to spaces, identities, urban representations or values, but is made of multiple orders of value and groups of people often running parallel to each other. Tourists, blind people, traders and writers, to name just those characters mentioned in this part, but certainly many other city publics, are assembled together in multiple ways in the streets and stages of the city, enacting thereby multiple cities: in literary imagination, in touristic worlds, in the economy, in blind everyday life. In Chapter 9, 'The reality of urban tourism: framed activity and virtual ontology', I pose the question 'How can tourism become an urban reality?' and begin by looking at how bus tours, and their complex sociotechnical arrangement, make tourist activity in urban settings possible. The emergence of an urban destination, though, involves the constitution of a virtual urban ontology which enables and is enabled by actual tourist activity. In Chapter 10, 'Assembling money and the senses: revisiting Georg Simmel and the city', Michael Schillmeier shows that, for Simmel, urban spaces already constituted intensive spaces of intermittent circulations and translations of human and non-human configurations. By looking at everyday practices of blind people in the city such as 'going shopping' or 'dealing with money', Schillmeier reassembles Simmel's work on the senses with his insights on the money economy and urban life and opens up thereby the conventional use of Simmel in urban studies, which often suffices in highlighting the psycho-cultural effects of big-city public culture. In Chapter 11, 'The city as value

locus: markets, technologies, and the problem of worth', Caitlin Zaloom discusses how urban assemblages enable not just price-setting for the market economy but the production of value in the economy. Not just at the Chicago Board of Trade, a skyscraper enacting the whole history of the city in its relation to the global financial economy, but also at the virtual markets of the financial economy, Zaloom unveils the economic quality and necessity of urban assemblages. In Chapter 12, 'Second empire, second nature, secondary world: Verne and Baudelaire in the capital of the nineteenth century', Rosalind Williams asks whether a different picture of mid-nineteenth-century urbanization and literature emerges if, instead of Charles Baudelaire, one looks at the character and work of Jules Verne. Stressing Verne's continuing connections with Nantes and reading his recently uncovered novel *Paris in the Twentieth Century*, Williams discusses his literary efforts to build a 'human world' in the midst of the rapidly emerging 'human empire' through art, social ties and technologies. This part concludes with an interview with Rob Shields, Henry Marshall Tory Chair and Professor of Sociology, Arts and Design at the University of Alberta. Shields pioneered in the early 1990s the exploration of space from non-representational perspectives and recently again with his explorations of the urban as a virtuality.

This volume, which is something of a prospectus based on rigorous analysis of highly specific urban issues, invites reflection on the ways the contributions have demonstrated what urban studies under the aegis of ANT might be good at doing and what limitations might be revealed. Can such work capture the quotidian experience of the city as well as the way it works? Is there an urban imaginary that could frame urban experiences and articulate multiple urban assemblages? What is the relation of networks to that imaginary? Thomas Bender's 'Postscript: Reassembling the city: networks and urban imaginaries' stresses the usefulness and fascinations of working with the idea, insights and sensibility of ANT, explores the work and agency of both networks and imaginaries in reassembling the city, and finally examines the politics of urban studies built on ANT.

REFERENCES

- Aibar, E. and Bijker, W. (1997) 'Constructing a City: The Cerda Plan for the Extension of Barcelona', *Science, Technology & Human Values*, 22(1): 3.
- Amin, A. and Graham, S. (1997) 'The Ordinary City', *Transactions of the Institute of British Geographers*, 22: 411–29.
- Amin, A. and Thrift, N. (2002) *Cities: Reimagining the Urban*, Cambridge, Oxford: Polity.
- Augé, M. (1995) *Non Places: Introduction to an Anthropology of Hypermodernity*, New York: Verso.
- Brain, D. (1994) 'Cultural Production as "Society in the Making": Architecture as an Exemplar of the Social Construction of Cultural Artifacts', in D. Crane (ed.), *The Sociology of Culture*, Oxford: Blackwell, pp. 191–220.

- Brand, R. (2008) 'People plus Technology: New Approaches to Sustainable Mobility', *Built Environment*, 34(2): 133–9.
- Brenner, N. (2004) *New State Spaces: Urban Governance and the Rescaling of Statehood*, New York, Oxford: Oxford University Press.
- Burgess, E.W. (1925) 'The Growth of the City: An Introduction to a Research Project', in R. Park and E.W. Burgess (eds), *The City: Suggestions for Investigation of Human Behaviour in the Urban Environment*, Chicago: University of Chicago Press, pp. 47–62.
- Callon, M. (1986) 'Some Elements of a Sociology of Translation: Domestication of the Scallops and the Fishermen of St-Brieuc Bay', in J. Law (ed.), *Power, Action, and Belief: A New Sociology of Knowledge?*, London: Routledge & Kegan Paul, pp. 196–233.
- Callon, M. (1996) 'Le travail de la conception en architecture', *Situations: Les Cahiers de la recherche architecturale*, 37(1er trimestre): 25–35.
- Callon, M. (1998) 'The Embeddedness of Economic Markets in Economics: Introduction', in M. Callon (ed.), *The Laws of the Market*, Oxford, Malden, MA: Blackwell Publishers.
- Callon, M. (2001) 'Actor-Network Theory', in Neil Smelser and Paul Baltes (eds), *International Encyclopedia of the Social and Behavioral Sciences*, Amsterdam: Pergamon Press, pp. 62–6.
- Christaller, W. (1933) *Die zentralen Orte in Süddeutschland*, Jena: Gustav Fischer.
- Collier, S.J. and Ong, A. (2004) 'Global Assemblages, Anthropological Problems', in S.J. Collier and A. Ong (eds), *Global Assemblages: Technology, Politics, and Ethics as Anthropological Problems*, London: Blackwell.
- Coutard, O. (1999) *The Governance of Large Technical Systems*, London, New York: Routledge.
- Coutard, O. and Guy, S. (2007) 'STS and the City: Politics and Practices of Hope', *Science, Technology & Human Values*, 32(6): 713.
- Cronon, W. (1991) *Nature's Metropolis: Chicago and the Great West*, New York: W.W. Norton.
- de Certeau, M. (1988) *The Practice of Everyday Life*, Berkeley, London: University of California Press.
- de Laet, M. and Mol, A. (2000) 'The Zimbabwe Pump: Mechanics of a Fluid Technology', *Social Studies of Science*, 30: 225–63.
- DeLanda, M. (2000) *A Thousand Years of Nonlinear History*, New York: Swerve Editions.
- DeLanda, M. (2006) *A New Philosophy of Society: Assemblage Theory and Social Complexity*, London, New York: Continuum.
- Deleuze, G. (1988) *Bergsonism*, New York: Zone Books.
- Deleuze, G. and Guattari, F. (1981) 'Rhizome', *Ideology and Consciousness*, 8: 49–71.
- Delgado, M. (2007) *Sociedades movedizas: Pasos hacia una antropología de las calles*, Barcelona: Anagrama.
- Fainstein, S.S., Gordon, I. and Harloe, M. (1992) *Divided Cities: New York and London in the Contemporary World*, Oxford: Blackwell.
- Fishman, R. (1987) *Bourgeois Utopias: The Rise and Fall of Suburbia*, New York: Basic Books.
- Florida, R. (2002) *The Rise of the Creative Class: And How It's Transforming Work, Leisure and Everyday Life*, New York: Basic Books.
- Gandy, M. (2005) 'Cyborg Urbanization: Complexity and Monstrosity in the

- Contemporary City', *International Journal of Urban and Regional Research*, 29(1): 26–49.
- Garreau, J. (1991) *Edge City: Life on the New Frontier*, New York: Doubleday.
- Girard, M. and Stark, D. (2006) 'Socio-Technical Assemblies: Sense-Making and Demonstration in Rebuilding Lower Manhattan', in D. Lazer and V. Mayer-Schoenberger (eds), *Governance and Information: The Rewiring of Governing and Deliberation in the 21st Century*, New York, Oxford: Oxford University Press.
- Graham, S. (2005) 'Switching Cities Off', *City*, 9(2): 169–94.
- Graham, S. (2006a) 'Cities and the "War on Terror"', *International Journal of Urban and Regional Research*, 30(2): 255–76.
- Graham, S. (2006b) 'Cities, War, and Terrorism: Towards an Urban Geopolitics', *Annals of the Association of American Geographers*, 96(1): 216–18.
- Graham, S. and Marvin, S. (2001) *Splintering Urbanism: Networked Infrastructures, Technological Mobilities, and the Urban Condition*, London, New York: Routledge.
- Graham, S. and Thrift, N. (2007) 'Out of Order: Understanding Repair and Maintenance', *Theory, Culture & Society*, 24(3): 1.
- Granovetter, M. (1985) 'Economic Action and Social Structure: The Problem of Embeddedness', *American Journal of Sociology*, 91(3): 481–510.
- Guy, S. and Moore, S.A. (2005) *Sustainable Architectures: Cultures and Natures in Europe and North America*, New York: Spon Press.
- Haraway, D. (1985) 'A Manifesto for Cyborgs: Science, Technology, and Socialist Feminism in the 1980s', *Socialist Review*, 80: 65–107.
- Houdart, S. (2006) 'Des multiples manières d'être réel', *Terrain*, 46: 107–22.
- Hughes, T.P. (1983) *Networks of Power: Electrification in Western Society, 1880–1930*, Baltimore, MD: Johns Hopkins University Press.
- Latour, B. (1988) *The Pasteurization of France*, Cambridge, MA: Harvard University Press.
- Latour, B. (1999) 'On Recalling ANT', in J. Law and J. Hassard (eds), *Actor Network Theory and After*, Oxford: Blackwell, pp. 15–25.
- Latour, B. (2003) 'The Promises of Constructivism', in D. Ihde and E. Selinger (eds), *Chasing Technoscience: Matrix for Materiality*, Bloomington: Indiana University Press, pp. 27–46.
- Latour, B. (2004) *Politics of Nature: How to Bring the Sciences into Democracy*, Cambridge, MA: Harvard University Press.
- Latour, B. (2005) *Reassembling the Social: An Introduction to Actor-Network Theory*, Clarendon Lectures in Management Studies, Oxford, New York: Oxford University Press.
- Latour, B. (2008) 'Coming Out as a Philosopher', in Acceptance speech for the third Siegfried Unseld Preis, Frankfurt.
- Latour, B. and Hermant, E. (1998) *Paris ville invisible*, Paris: Les empêcheurs de penser en rond, La Découverte.
- Latour, B. and Woolgar, S. (1986) *Laboratory Life: The Construction of Scientific Facts*, Princeton, NJ: Princeton University Press.
- Latour, B. and Yaneva, A. (2008) 'Give Me a Gun and I Will Make All Buildings Move': An ANT's View of Architecture', in R. Geiser (ed.), *Explorations in Architecture: Teaching, Design, Research*, Basel: Birkhäuser, pp. 80–9.
- Law, J. (1986) 'On the Methods of Long-Distance Control: Vessels, Navigation and the Portuguese Route to India', in J. Law (ed.), *Power, Action and Belief: A New Sociology of Knowledge*, London: Routledge & Kegan Paul, pp. 234–63.

- Law, J. (1987) 'Technology and Heterogeneous Engineering: The Case of Portuguese Expansion', in W.E. Bijker, T.P. Hughes and T.J. Pinch (eds), *The Social Construction of Technological Systems: New Directions in the Sociology and History of Technology*, Cambridge, MA: MIT Press, pp. 111–34.
- Law, J. (1992) 'Notes on the Theory of the Actor-Network: Ordering, Strategy, and Heterogeneity', *Systemic Practice and Action Research*, 5(4): 379–93.
- Law, J. (2004) *After Method: Mess in Social Science Research*, London: Routledge.
- Law, J. and Hassard, J. (1999) *Actor Network Theory and After*, Oxford: Blackwell, Sociological Review.
- Law, J. and Singleton, V. (2005) 'Object Lessons', *Organization*, 12(3): 331–55.
- Lefebvre, H. (1991) *The Production of Space*, London: Basil Blackwell.
- Marcus, G. and Saka, E. (2006) 'Assemblage', *Theory, Culture & Society*, 23(2–3): 101–6.
- Marcuse, P. (2006) 'What is "the" City?', Unpublished text, Center for Metropolitan Studies, Technical University of Berlin.
- McKenzie, R.D. (1926) 'The Scope of Human Ecology', *American Journal of Sociology*, 32: 141–54.
- Mitchell, W.J. (1998) 'Cyborg Civics', *Harvard Architecture Review*, 10: 164–75.
- Mitchell, W.J. (2003) *Me++: The Cyborg Self and the Networked City*, Cambridge, MA, London: MIT Press.
- Mol, A. (2002) *The Body Multiple: Ontology in Medical Practice*, Durham, NC: Duke University Press.
- Mollenkopf, J. and Castells, M. (1991) *Dual City: Restructuring New York*, New York: Sage.
- Muniesa, F., Millo, Y. and Callon, M. (2007) 'An Introduction to Market Devices', in M. Callon, Y. Millo and F. Muniesa (eds), *Market Devices*, Malden, MA, Oxford: Blackwell, Sociological Review, pp. 1–12.
- Neff, G., Fiore-Silvast, B. and Dossick, C. (2009) 'Model Failure: Assemblages, Performances, and Uneasy Collaborations in Commercial Construction', Paper presented to American Sociological Meetings, San Francisco, August.
- Park, R.E. (1925) 'The City: Suggestions for the Investigation of Human Behavior in the Urban Environment', in R.E. Park and E.W. Burgess (eds), *The City: Suggestions for Investigation of Human Behavior in the Urban Environment*, Chicago: University of Chicago Press, pp. 1–46.
- Park, R.E. (1929) 'The City as a Social Laboratory', in T.V. Smith and L.D. White (eds), *Chicago: An Experiment in Social Science Research*, Chicago: Chicago University Press, pp. 1–19.
- Park, R.E. (1952) *Human Communities: The City and Human Ecology*, Glencoe, IL: Free Press.
- Phillips, J. (2006) 'Agencement/Assemblage', *Theory, Culture & Society*, 23(2/3): 108–9.
- Pinch, T. and Bijker, W. (1984) 'The Social Construction of Facts and Artefacts: Or How the Sociology of Science and the Sociology of Technology might Benefit Each Other', *Social Studies of Science*, 14(3): 399.
- Sassen, S. (1991) *The Global City: New York, London, Tokyo*, New York: Princeton University Press.
- Sassen, S. (2005) 'The Embeddedness of Electronic Markets: The Case of Global Capital Markets', in K. Knorr-Cetina and A. Preda (eds), *The Sociology of Financial Markets*, New York: Oxford University Press, pp. 17–37.
- Shields, R. (2006) 'Flânerie for Cyborgs', *Theory, Culture & Society*, 23(7–8): 209–20.

- Simmel, G. (1903) 'Die Großstädte und das Geistesleben', in T. Petermann (ed.), *Die Großstadt: Vorträge und Aufsätze zur Städteausstellung*, Dresden: Jahrbuch der Gehe-Stiftung Dresden, pp. 185–206.
- Smith, N. (1992) 'Geography, Difference and the Politics of Scale', in J. Doherty, E. Graham and M. Malek (eds), *Postmodernism and the Social Sciences*, London: Macmillan, pp. 57–79.
- Soja, E. (1996) *Thirdspace: Journeys to Los Angeles and Other Real-and-Imagined Places*, London: Blackwell.
- Soja, E. (1997) 'Six Discourses on the Post-Metropolis', in S. Westwood and J. Williams (eds), *Imagining Cities: Scripts, Signs, Memory*, London: Routledge.
- Soja, E. (2000) *Postmetropolis: Critical Studies of Cities and Regions*, Oxford: Blackwell.
- Summerton, J. (1994) *Changing Large Technical Systems*, Boulder, CO, Oxford: Westview Press.
- Swedberg, R. (1997) 'New Economic Sociology: What Has Been Accomplished, What Is Ahead?', *Acta Sociologica*, 40(2): 161.
- Swyngedouw, E. (1996) 'The City as a Hybrid: On Nature, Society and Cyborg Urbanization', *Capitalism, Nature, Socialism*, 7: 65–80.
- Swyngedouw, E. (1997) 'Power, Nature, and the City: The Conquest of Water and the Political Ecology of Urbanization in Guayaquil, Ecuador: 1880–1990', *Environment and Planning A*, 29(2): 311–32.
- Swyngedouw, E. and Heynen, N. (2003) 'Urban Political Ecology, Justice and the Politics of Scale', *Antipode*, 35(5): 898–918.
- Teubner, G. (2006) 'Rights of Non-Humans? Electronic Agents and Animals as New Actors in Politics and Law', *Journal of Law and Society*, 33(4): 497.
- Thrift, N. (1993) 'An Urban Impasse?', *Theory, Culture & Society*, 10(2): 229–38.
- Thrift, N. (2007) *Non-Representational Theory: Space, Politics, Affect*, London: Routledge.
- Weber, M. (1986) *The City*, Glencoe, IL: Free Press.
- Wirth, L. (1938) 'Urbanism as a Way of Life', *American Journal of Sociology*, 44(1): 1–24.
- Woolgar, S., Neyland, D., Lezaun, J., Cheniti, T. and Sugden, C. (2008) 'A Turn to Ontology in STS? Ambivalence, Multiplicity and Deferral', Session in 'Acting with Science, Technology and Medicine', Four-Yearly Joint Conference of the Society for Social Studies of Science (4S) and European Association for the Study of Science and Technology (EASST), Rotterdam.
- Yaneva, A. (2005a) 'A Building is a Multiverse', in B. Latour and P. Weibel (eds), *Making Things Public: Atmospheres of Democracy*, Karlsruhe, Cambridge, MA: KFZ, MIT Press, pp. 530–5.
- Yaneva, A. (2005b) 'Scaling Up and Down: Extraction Trials in Architectural Design', *Social Studies of Science*, 35(6): 867.
- Yaneva, A. (2008) 'How Buildings "Surprise": The Renovation of the Alte Aula in Vienna', *Science Studies*, 21: 8–29.
- Zukin, S. and DiMaggio, P. (1990) *Structures of Capital: The Social Organization of the Economy*, New York: Cambridge University Press.