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What is This?

World city actor-networks

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Abstract: This paper introduces some new theoretical ideas to a literature that is just beginning
to conceptualize globalization and cities as networks. The idea of networks is a fashionable one,
but the idea is not new and has taken several forms over the years. This paper discusses some
of the more recent and influential ideas about networks to argue for some new theoretical and
empirical directions in the field of globalization and world cities. First, the shift from the idea of
a hierarchy of world cities developed by writers such as John Friedmann to the idea of a world
city network developed by writers such as Peter Taylor is discussed. Second, the paper provides
a critique of the neo-Marxist account of globalization as a series of meta-networks advanced by
Manuel Castells to expose the limitations of an approach that has been broadly adopted by
several globalization and world cities scholars. Finally, it is argued that further progress in
the conceptualization and empirical study of world cities and their networks can be made
through an engagement with the literatures of actor-network theory and non-representational
theory.

Key words: actor-network theory, network, non-representational theory, poststructuralism,
world city.

I Introduction to networks

... in terms of the flow of goods, information and people we live in many respects in an era that is both mobile
and global. Networks of information, of sociation, span the world.
<div align="right">Law and Hetherington (2000: 34)</div>

The new millennium marks yet another urban milestone: not only is this the first urban century, it is the first
century in which the world's city dwellers will form part of a single networked globe.
<div align="right">Hall and Pfeiffer (2000: 5)</div>

The idea of networks is an old one even within geography. Without going back too far,
it can be said that networks were a popular idea for positivists in the 1960s and the
1970s following the publication of such seminal works as *Locational analysis in human
geography* (Haggett, 1965) and then *Network analysis in geography* (Haggett and Chorley,
1969). Networks then fell out of popular usage in the 1980s when the Marxist critique
of political economy dominated the discussion of human geography. However, the idea

of networks has become fashionable once again since the mid-1990s, with the rapid pace of globalization and the increased role of information technology in many everyday lives. Today, talk of networks can be found across all manner of literatures in human geography and the social sciences, and is even the rationale for new journals such as *Global Networks: A Journal of Transnational Affairs*.

Yet why did we (re)turn to the idea of networks in the 1990s? One answer is globalization, but another reason is because of the foregrounding of space and networks by poststructuralist theory. The genius of Foucault (1986) was that he inspired a generation to shift their model of thinking from time and history to space and networks. In other words, Foucault was aware of the significance of globalization and thus geography (1986: 22):

> The great obsession of the nineteenth century was, as we know, history: with its themes of development and of suspension, of crisis and cycle, themes of ever-accumulating past, with its great preponderance of dead men and the menacing glaciation of the world. . . . The present epoch will perhaps be above all the epoch of space. We are in the epoch of simultaneity: we are in the epoch of juxtaposition, the epoch of the near and far, of the side-by-side, of the dispersed. We are at a moment, I believe, when our experience of the world is less that of a long life developing through time than that of a network that connects points and intersects with its own skein.

Foucault's ideas led the urban geographer Soja (1989) to call for 'the reassertion of space in critical social theory'. However, it is Foucault's linking of space and networks through a relational perspective which is crucial and which has been somewhat missed by urban geographers in their rush towards explaining and describing the postmodern city (e.g., Soja, 1989; 2000). In fact, when networks are discussed in urban geography (e.g., Camagni and Salone, 1993); the discussion is more often than not based on a completely different theoretical tradition to that developed by, and from, Foucault.

In the field of globalization and world cities,[1] the idea of networks advanced by the urban sociologist Castells in his trilogy of books (1996; 1997; 1998) has been particularly influential. His ideas have most noticeably been taken up by Beaverstock *et al.* (2000a) as the theoretical base for empirical research into the world city network (Beaverstock *et al.*, 2001a; Taylor, 2001; Taylor *et al.*, 2001a; 2001b), and by Graham and Marvin (1996; 2001) who like Castells (see the interview-cum-article by Marais, 2000, on Castells' visit to South Africa) argue for a 'progressive networked urbanism',[2] and a '. . . critical urbanism of the networked city' (2001: 420). However, outside of urban geography the idea of networks has become more and more noticeable with the increasing celebrity and citation of actor-network theorists and writers in the field of Science and Technology Studies (STS) such as Latour, Callon, Serres, Law and Hetherington, whose work has grown out of poststructuralist theory and the ideas of Foucault and Deleuze (and Guattari) in particular (e.g., Law and Hassard, 1999; Murdoch, 1997a; 1997b). Indeed, in a recent review (R.G. Smith, 2001) I made the point that the ideas of poststructuralism, actor-network theory (ANT) and non-representational theory seem to have largely bypassed urban geography and it is that oversight that this paper will start to address.

To reach a new conceptualization of world cities as actor-networks this paper is in three parts. First, the shift from the idea of a hierarchy of world cities developed by writers such as Friedmann (1986; 1995), Reed (1981), Thrift (1989) and Sassen (1994a; 1994b; 1999a) to the idea of a world city network of links and relations invented by Beaverstock *et al.* (1999; 2000a; 2003) is discussed. Second, the paper provides a critique of the neo-Marxist account of globalization as a series of meta-networks advanced by

Castells, and adopted by others (e.g., Beaverstock *et al.*, 2000a), to expose the limitations of a theoretical approach that privileges economic and technological explanation for network development. Finally, it is shown how further progress in the conceptualization and empirical study of world cities and their networks can be made through an engagement with the poststructuralist inspired literatures of ANT and non-representational theory.[3]

II   World city networks

Relations between cities cannot be 'enframed' as small versions of simple international relations. With globalization, there has been the creation of a world city interlocking network that relates to, but exists separate from, traditional international relations and the comparative study of countries.

Beaverstock *et al.* (2001b: v)

It is quite normal to think of the urban as a series of networks: both social and technological. Indeed, the city is often visualized using a network diagram, particularly by those who are unfamiliar with its complexity, and with the details of particular places. Think of the underground, subway or bus map given to new visitors to a city by the tourist authorities.... Through networks and through diagrams of networks the scale and complexity of the city is made manageable.

Barry (2000: 283)

'Global City-Regions' was the title of an international conference held in Los Angeles (21–23 October 1999)[4] that attracted many speakers, including famous academics such as Sir Peter Hall and Saskia Sassen, community leaders such as the mayors of Berlin, São Paulo and Sydney, and powerful individuals such as the President of the World Bank. However, it was not the individual contributors but rather the title of the conference itself that first attracted my attention. It reminded me of the chapter on 'world cities and city regions' by the late Scottish town planner Sir Patrick Geddes in his seminal book *Cities in evolution* (1915). That said, the presence of so many city mayors did also make me think of Geddes and his little contribution to the idea, at the outset of the twentieth century, of a 'world league of cities' (cf. a 'league of nations'; Geddes, 1924; Anon, 1923), an idea which seems to resonate with all those recent arguments about globalization and the fate of the nation state. In fact, for the purposes of this paper reading Geddes is also interesting because it reveals to you that thinking about world city connections and networks (rather than hierarchies of cities in and across nation states) is not as unprecedented as you might think.

Hall begins his seminal text on *The world cities* (1966) by stating that 'There are certain great cities, in which a quite disproportionate part of the world's most important business is conducted. In 1915 the pioneer thinker and writer on city and regional planning, Patrick Geddes, christened them *the world cities*' (Hall, 1966: 7). This statement and reference to Geddes is widely quoted in the world city literature as the 'founding source' of the research area (e.g., see Johnston, 2000). However, revisiting Geddes' 1915 book, and specifically his chapter on 'World cities and city regions', it is clear that, while his main contribution was indeed the idea of large cities as conurbations which he called world cities, Geddes did also briefly remark on the emergence of relations and connections between cities.

Hall's (1966) book pioneered a remarkable research agenda which was advanced (Friedmann and Wolff, 1982; Friedmann, 1986) and then laid out by Friedmann in his statement of 'Where we stand: a decade of world city research' (1995). Hall's book is a

comparative study of the internal characteristics or attributes of several key cities (London, Paris, Moscow, New York and Tokyo) and city complexes (Randstad-Holland and Rhine-Ruhr). However, Hall's focus, and the quick moves from Geddes (1915) to Hall (1966) to Hymer (1972) to Cohen (1981) to Friedmann (1986) to Sassen (1991; 1994a) in subsequent accounts, is problematic in many ways, but not least because it has resulted in a neglect of the *relations* (the flows of capital, people, information, ideas, technologies, commodities, practices, etc.) between world cities which in fact is what makes them – through networks – the command and control centres of the world. In short, the fact that the ability of cities to be a success depends to a large extent upon their participation within networks has been skipped over in favour of looking at what makes them tick. It is this mistake that Geddes does not make and which has been overlooked in the production of so many comparative studies. Geddes (1949: 23) describes the increasing connectivity of cities thus: 'Greater New York, now linked up, on both sides, by colossal systems of communications above and below its dividing waters, is also rapidly increasing its links with Philadelphia – itself no mean city – and with minor ones without number in every direction possible'. Geddes noticed the emergence of New York's networks, with all manner of connections, as increasingly important even at the beginning of the twentieth century.

A recent article in *Newsweek* highlighted New York's connections to a degree that even Geddes could not have predicted. McGuire and Chan (2000), in an article entitled 'The NY-LON life', highlighted one aspect of the rise of Atlanticism by pointing to the intense connections between New York and London in terms of transatlantic commuters (i.e., élite migrants for whom transnational commuting back and forth from the Street to the City is commonplace; e.g., see Beaverstock and Smith, 1996). Geographers such as Allen *et al.* (1998: 68) have noted how social relations stretch 'beyond the region', about how:

> The City of London is a dominant node, its connections with other regions and with other countries and continents far outweighing in significance its more local connections to the region within which it is locationally set. It is a place which is internationally embedded. To describe the geographical location of the City in terms of the social relations which sustain it and give it its identity necessitates beginning at an international level. Moreover, this is a set of international links with a particular geography (they are links to particular parts of the world) and they constitute a network in which the City forms a node of considerable power and dominance.

They observe that '... this global reorientation can be seen to have increased the "distance" of the City of London from the rest of the UK (including even the south-east) whilst, at the same time, the City has moved "closer" to Tokyo and New York' (Allen *et al.*, 1998: 75–76). However, McGuire and Chan (2000) go even further than these geographers to suggest that a bicontinental megalopolis that we might term NY-LON is emerging.[5] They observe that 'As different as New York and London are, a growing number of people are living, working, and playing in the two cities as if they were one' (McGuire and Chan, 2000: 42). Indeed, the flows and connections between these two global cities (often described as the twin engines of much of globalization) are so intense that each city has dramatic consequences for each other and on those who live, work and play in each. Indeed, New York and London are becoming in many ways (not just through élite migration) one transnational city. For example, Richard Corrigan of Merrill Lynch in London said that 'In terms of our business . . . the cities [New York and London] are beginning to meld into one massive whole' (cited in McGuire and Chan,

2000: 43). The explosion in international finance was the key catalyst for the creation of NY-LON, but the two cities are also drawn together by a shared language and culture that long ago linked Broadway and the West End, and today helps explain the NY-LON nexus in such sectors as film, television, pop music, publishing and the new economy. Furthermore, the intensity of the connections between the two cities helps to explain their gentrification and the emergence of elite residential areas such as Belgravia in London and the Upper East Side in New York. In short, the nature and intensity of the connections, flows and relations between these two global cities is so intense that they are becoming in many ways one transnational city, and the consequences of the myriad of flows between the two cities for their economic, cultural, political and social restructuring is perhaps considerable and certainly in need of research.[6]

It is only now in the twenty-first century, with the rise of globalization and the development of so many networks, that the existence of a city such as NY-LON is possible. Ideas about networks are gaining ground across the social sciences in disciplines such as geography (e.g., Beaverstock *et al.*, 2000a), urban studies (e.g., Graham and Marvin, 2001; M.P. Smith, 2001), sociology (e.g., Castells, 1996, 1997, 1998), and international relations (e.g., Colonomos, 2001). Today the idea of a hierarchy of world cities in the world economy produced by Friedmann and developed by others seems less useful as a way to conceptualize global urban change. Networks seem a more promising idea; however, while there is now much research on the nodes (the world cities) in the networks, and much-needed research is now starting to be undertaken on the relations, flows and connections between these nodes, *the importance of a conceptual and empirical shift still needs to be promoted*. In other words, some theories are needed that will facilitate a reorientation of the empirical study of world cities from *comparative* studies of internal similarities and differences within cities to a study of the *relations* between cities.

The empirical shift is under way. This began when Short *et al.* (1996) identified an empirical hole at the heart of the globalization and world cities literature: the lack of relational data examining the flows between cities. This was termed the 'dirty little secret of world cities research' and was an observation picked up by many such as Knox (1998: 26) who writes that, ' . . . few of the available data reveal anything about the flows and interdependencies that are at the heart of the idea of world cities as basing points for transnational capitalism', or Hannerz (1996: 128–29) who observes that 'We need to combine the various kinds of understandings we have concerning the internal characteristics of urban life in the world cities with those which pertain to their external linkages'. Subsequently a new empirical agenda was been taken up by Beaverstock *et al.* (2000b) to generate the new relational data (cf. state-centric data) that describes Castells' 'space of flows' and grasps the links and relationships between cities that make up the world city network (Beaverstock *et al.*, 2000a). However, the conceptual shift to the idea of networks has not been as original as the empirical shift, but has rather been to mould globalization and world cities research according to the somewhat restrictive theoretical style of Castells' neo-Marxism.

What I am arguing is that a conceptual shift still needs to be made. Two literatures, I think, have moved our thinking of cities along the right lines recently (but have not gone far enough). First, in recent years some geographers have been trying to imagine cities from what might be called a relational perspective (for an early example, see Massey, 1994). Amin *et al.* (2000) define cities in terms of processes and interactions.

Cities are seen as social arenas of interaction, rather than as places containing 'things' such as buildings. This view of 'cities-as-places-of-interaction' where there is a 'geographical intensity of social relations and activities' (Amin *et al.*, 2000: 8) is the idea of Massey and other geographers at the Open University in the UK who have been thinking about cities as open intensities of social relations (Massey *et al.*, 1999; Allen *et al.*, 1999; Pile *et al.*, 1999). This is one way we could think about world city human networks (in contrast to ANT, non-humans are missing from this perspective) and, for example, the relations between the global cities of New York and London (the conceptualization of NY-LON as a flux of intensities). The relations between the two cities could be conceptualized and mapped as a gradation of intensities. In other words, the aim would not be to define at what point social relations became intense enough to be called a city because that would delimit what make the cities multiple and so perhaps fail to recognize that different people in different social groups within a city might be locked into international connections in different ways (Massey, 1999; 2000).

Second, there is an emerging body of work on the anthropology of transnationality (e.g., Meyer and Geschiere 1999) which unsurprisingly emphasizes the human (rather than the non-human) in thinking about transnational cultural networks. For example, Ong (1999: 4) strives to ' . . . capture the *horizontal* and *relational* nature of the contemporary economic, social, and cultural processes that stream across spaces' and has criticized Castells for presenting a totalizing and unidirectional discourse that sees globalization as transforming the economies and societies of the world into a single 'network society'. The product of narratives like Castells' for Ong (1999: 241) is that 'Politics, culture, and human agency are viewed only as the effects of globalizing processes, such as trade, production, and communications, rather than as vital logics that play a role in shaping the distribution, directionality, and effects of global phenomena'. Similarly, M.P. Smith (2001) has critiqued top-down approaches to globalization to try to argue that research should focus on the agency of transnational networks. Furthermore, the social anthropologist Hannerz (1996) emphasizes people (four categories: transnational business élites, third-world populations in first-world cities, workers in cultural industries, and tourists) in his writing on the transnational flow of culture and 'the cultural role of world cities'. However, I think that our conceptualization of space, globalization and world cities would be improved further if we were to move beyond even these 'new' literatures and engage with ANT and non-representational theory.

The theoretical background for conceptualizing world city networks and the rise of cities such as NY-LON could be the neo-Marxist theory provided by Castells, who argues that 'Our society is constructed around flows: flows of capital, flows of information, flows of technology, flows of organizational interaction, flows of images, sounds, and symbols' (1996: 411–12). Castells (1996) defines globalization as a 'network society' constituted across space as a myriad of linkages, connections and relations – a 'space of flows' – which represents the new spatial logic of the informational age. For Castells, cities now accumulate and retain wealth and power because of what flows through them (information, knowledge, money and cultural practices, for example). The research by Beaverstock *et al.* (2000a) accepts Castells' theoretical contribution about flows, but questions his empirical research which contradicts his theoretical argument because it is concerned with the nodes in the networks (attributes) and not with the flows between them (the relations which make networks). If we were to follow

Beaverstock *et al.* (2000a) and reject Castells' empirical approach, but still adopt his neo-Marxist theory as a conceptual background for generating new relational data, then we would make some progress in understanding the world city network and NY-LON (e.g., see the study on London-Frankfurt relations by Beaverstock *et al.*, 2001b). We would move beyond a simple concern for what these cities contain to also consider their connections and interactivities with each other.

However, as will be explained in the next section, there are many large question marks as to whether Castells' theoretical contribution is the best approach now available to make progress in researching world city networks. In other words, if we want to research world city actor-networks then we cannot follow Castells. We have to think about space, cities and the networks of globalization rather differently than we have become accustomed to, and in fact these new theoretical approaches also get us away from quantitative empirical research on world city economic networks (Taylor, 2001; Taylor *et al.*, 2001a; 2001b). For example, the neo-Marxist-cum-quantitative approach of Taylor is fine as far as it goes in following Castells and Sassen to conceptualize the linking of cities through the world economy and advanced producer services (for the foundation of Taylor's recent work see Beaverstock *et al.*, 1999; 2000a; 2003), but this research is also a little like 'counting door knockers'. What is needed are new approaches that help us to go beyond counting – to go through those doors to find out precisely how networks work and are maintained over long distances. It is my contention that ANT and non-representational theory can give us a richer poststructuralist-inspired conceptualization of networks and provide the rationale for the adoption of a whole range of qualitative methods (such as ethnomethodology; see Latour, 1999; Garfinkel, 1967; Button, 1991) for understanding the actual organization of world city networks.

III   Manuel Castells' meta-network society

> Networks constitute the new social morphology of our societies, and the diffusion of networking logic substantially modifies the operation and outcomes in processes of production, experience, power, and culture.
> Castells (1996: 469)

Manuel Castells' (1996; 1997; 1998) trilogy entitled *The information age: economy, society and culture* – a story about globalization, or more accurately about globally networked capitalism – has had a considerable influence across the social sciences in making us think about to what extent we live in a global network society. The crux of Castells' argument is that technological networks have given rise to 'timeless time' and thus facilitated a shift from a 'world economy' to a 'global economy' (Castells, 1996: 92–93):

> The informational economy is global. A global economy is a historically new reality, distinct from a world economy. A world economy, that is an economy in which capital accumulation proceeds throughout the world, has existed in the West at least since the sixteenth century, as Fernand Braudel and Immanuel Wallerstein have taught us. *A global economy is something different: it is an economy with the capacity to work as a unit in real time on a planetary scale.* While the capitalist mode of production is characterized by its relentless expansion, always trying to overcome limits of time and space, it is only in the late twentieth century that the world economy was able to become truly global on the basis of the new infrastructure provided by information and communication technologies. This globality concerns the core processes and elements of the economic system.

Castells' academic reputation was made in urban sociology with the publication of several influential books (1977; 1983; 1989), and consequently his recent works on

globalization have had some impact in urban research because cities are often viewed as a metaphor or touchstone for globalization itself. Indeed, Castells suggests that cities are becoming increasingly networked, and through what is now a famous example has discussed the links and nodes in the urban region of the Pearl River Delta. However, the main point is that Castells' books have both firmly linked the idea of networks to the idea of globalization and have led to networks being presented in many other accounts as vast coverings or nets that have been thrown down from on high to cover the globe. In short, Castells' work is a sort of meta-cartography of global capitalism that adopts the spatial metaphor of the network to highlight connectivity and describe the world as covered by a global 'space of flows', where we are – presumably in the last instance – dominated by '. . . the meta-network of financial flows' (1996: 472).

Thrift got a lot right in his critique of Castells back in 1995. Thrift criticizes Castells for his neo-Marxist approach to networks which he sees as too modernist and too abstract. He also criticizes Harvey's and Jameson's accounts of modernity for similar reasons and more recently has added Virilio (Thrift, 2000a) to his hit list because of how he exaggerates the consequences of speed on such things as cities. In Virilio's hands (Virilio, 1991) cities become 'overexposed' and mere instants in a global space of flows, but Thrift counters these accounts through the example of monetary networks which he shows to be always both 'local' and 'global' (see also Thrift, 1998a). For Thrift, the 'space of flows' postulated by Castells needs to be conceptualized rather differently as '. . . a partial and contingent affair, just like all other human enterprises, which is not abstract or abstracted but consists of social networks, often of a quite limited size even though they might span the globe' (Thrift, 1995: 34–35). The 'space of flows' is revealed by Thrift not to be as abstract, unpopulated and instantaneous as you might think from reading Castells and other neo-Marxist theorists (Thrift, 1995: 24). In short, it seems to me that for Thrift Castells' meta-narrative is rather like a city at pre-dawn when it appears, '. . . at its most simple: empty of people, stripped-back, a living map – a stage for pure process' (Stetter, 2000: 46). Indeed, people in Castells' account are like extras somehow strangely alien to the supposedly abstract machinations of late capitalism. Echoing his earlier work in urban sociology (1983), Castells recently set about 'Grassrooting the Space of Flows' (1999). However, the only people who seem to live in Castells' world are transnational élites, people taking part in social movements, and the small proportion of the world's population who have access to the internet. Castells' lack of attention to people and practices is odd, given that it is people who make up networks, people who make the ideas in networks, and people who put those ideas into practice.

Thrift has in many places pointed to the importance of human practices to the functioning of global cities such as London (e.g., 1996; 2000b), and in so doing has thrown cold water on those (knowingly or not) producing highly abstract and inhuman accounts of world cities. Yet there is even more to disagree with in the work of Castells and other famous neo-Marxists than even Thrift sees.[7] Yes, the argument made by Castells about networks is too abstract (like Corbusier's view of cities as machines), too impersonal (a detached theory and practice) and too unpopulated (by people and all the little things that are ignored and overlooked; Pile and Thrift, 2000), but it is also too immodest (a totalizing meta-theory that does not see that networks are always partial and cannot, and are not, simply mapped straight onto a messy and complex world), too exaggerated (pretending to encompass the world), too top-down (like a net falling from

the sky), too alien (not of this world) and too cumbersome and certain (inflexible with little space for contingency as networks are presented as snapshots freeze-framed in mid-stride) for actually getting at what makes networks work. However, let us be clear that in addition to Thrift's critiques the main faults with Castells' account are that it is technologically deterministic and also highly disempowering because of Castells' conceptualization of geographical scale.

Despite Castells' denials, his argument does rely on a technological determinism (e.g., see Fuller, 1999; cf. McGuigan, 1999, who defends Castells). When he writes of a new and now engrained 'networking logic', what he means is that 'While the networking form of social organization has existed in other times and spaces, the new information technology paradigm provides the material basis for its pervasive expansion throughout the entire social structure' (Castells, 1996: 469). This fantasizing about, or fixation on (Fuller, 1999), technology is in fact common with many big and spectacular accounts of the world; for example, think of Hall (1998) and his promotion of the idea of a fifth Kondratieff wave. They exaggerate in order to simplify, they pretend that the partial is the whole, they seduce us into thinking the world is somehow legible and reducible, and they remove the complexities introduced to any theory that takes people and practices seriously.

Castells has written a great deal about the information society (Castells, 1989; 2001) and its consequences for cities (Borja and Castells, 1997), and also on such developments as technopoles (Castells and Hall, 1994). It is perhaps no surprise, then, that his ideas about globalization and networks have the same inclination to foreground and overemphasize the importance of information technology and the changes it brings to societies and everyday lives. However, the writing that has come out of STS about social constructionism, or in other words about the social shaping of technology, seems more empowering than Castells' particular brand of technological determinism. Indeed, Castells' theory of global networks seems to me to be about nostalgia for a social science that impressed people because it was spectacular, big and able to lump together seemingly disparate things. However, even Friedmann can no longer accept Castells' meta-theoretical framework of endless binary oppositions (e.g., the global and local, the Net and the Self, the powerful and the weak), because his thesis '. . . appears very much as a form of technological, not to say capitalist, triumphalism which is ultimately disempowering' (2000: 113). I agree with Friedmann on this point about disempowerment, but not – as will be clear from the next section – with his suggestion that Castells could have avoided these problems by adopting, '. . . a *dialectical* analysis that focuses on the *internal contradictions* of informational capitalism . . .' (2000: 114). As you shall see, I think Castells and Friedmann need to think differently about scale as a way to sidestep the problem of disempowerment.

In summary, Castells resorts yet again (1977; 1989) to an exaggerated narrative where capital explains all and where contingency and the human are largely absent. The technological-economic determinism (and reductionism) of Castells' neo-Marxist account is evident, despite having been mobilized and disguised through the metaphor of the network, and indeed we can clearly see Castells' heritage when he writes that 'Networks converge toward a meta-network of capital that integrates capitalist interests at the global level and across sectors and realms of activity: not without conflict, but under the same overarching logic' (1996: 475). The world is presented by Castells as little more than a war between capital and labour where capital is global and labour is

local (1996: 475). Castells' meta-narrative is depressing and disempowering precisely because it is a restrictive technological-cum-economic conceptualization of networks where actors are seen as both secondary and trapped in the local. As will be shown in the next section of this paper Latour argues that if we are talking about networks then it is just not true, as Castells contends, that capital is global and labour is local.

IV World city actor-networks

> We therefore arrive at the actor-network: actors and networks become one and the same: it is now 'all for one and one for all' in the construction of joint actions. And as the actor-network grows so it will extend its influence and reach beyond a single locale into other locales, tying these together in sets of complex associations. There is, therefore, no difference in kind between 'macro' and 'micro' or 'global' and 'local' actors; longer networks can simply reach further than shorter networks.
>
> Murdoch (1997a: 331)

There is a great deal that can be said about the conceptualization of world city actor-networks as relational and highly contingent heterogeneous assemblages of the social and technological. Therefore, as no more than an introduction to world city actor-networks, this paper will limit itself to highlighting just a few points from ANT and non-representational theory: first, how ANT and the ideas of Latour both challenge conventional ideas about geographical scale, and provide a rich theory for researching the details and maintenance of world city actor-networks; and, second, how non-representational theory and the ideas of Thrift in particular mean we have to take people, mobile practices and performativity[8] more seriously in our studies of world city networks.

1   Latour, ANT and geographical scale

> The two extremes, local and global, are much less interesting than the intermediary arrangements that we are calling networks.
>
> Latour (1993: 122)

ANT (or 'actant-rhizome' theory if one wants to highlight the Deleuzian influence on ANT) is a relatively new, and still rapidly developing, direction in social theory that has emerged from poststructuralism – the writings of Foucault and Deleuze (and Guattari) in particular – and sociological studies of science (e.g., laboratory studies) and technology with the writings of Serres (a French philosopher of science), Latour (a French engineer) and others such as Callon and Law being particularly significant. For ANT, the world and networks cannot be explained through the binary oppositions so often deployed in dualistic social theory (e.g., structure/agency, inside/outside, culture/nature, subject/object, tradition/modernity, social/technological, city/infrastructure, macro/micro, global/local, etc; see Law, 1986; Murdoch, 1997a). Rather, the world by ANT is a world of 'heterogeneous engineering' because it is always in the process of being made through a multiplicity of different materials (e.g., machines, money, documents, texts, mobile technologies) that are enrolled and mobilized to form the very relations and connections of the heterogeneous activities that make up any network.

There is much that can be said about ANT (early examples in 'geography' texts include Murdoch, 1997a; 1997b; Murdoch and Marsden, 1995; Bingham, 1996;

Hinchcliffe, 1996; Whatmore, 1997) and so, as a way of making a meaningful introduction for world city scholars to some of the relevant ideas perhaps here it would be apposite just to explain how the shift away from the idea of hierarchies towards the idea of networks has to be accompanied by another shift. *If we are thinking about cities as networks, then we also have to change the way we think about geographical scale.*

Consider the 'new frontier zone' described, or rather invented, by Sassen (1999b: 149) between the global and the national:

> The encounter of a global actor – firm or market – with one or another instantiation of the national state can be thought of as a new frontier zone. It is not merely a dividing line between the national economy and the global economy. It is a zone of politico-economic interactions that produce new institutional forms and alter some of the old ones.

The line or zone Sassen draws between global and national geographical scales reminds me of all those ideas and debates we have had about framing global-local relations. Mosaics (the global as a bunch of locals) or systems (global relations producing local differences) used to be popular when thinking about geographical scales; then we had all those other arguments about the global-local nexus (e.g., see Beauregard, 1995), including that bad neologism and rather undeveloped concept of the 'glocal' which appeared just a few years ago. However, Sassen's mention of lines and zones also stirs me to think of that wonderful but too often forgotten argument made by world-systems theorists that all scales (like all 'facts') are actually manu*fact*ured. The argument Taylor (1981, 1982) made from Wallerstein's invention and development of world-systems analysis is that there are no 'natural' scales which are somehow 'out there', it is just that different theories invent different scales for different purposes, and world-systems analysis has three scales – world economy (reality), nation state (ideology) and locality (experience) – because that is what its theoretical arguments require. To avoid confusion, Thrift is succinct: 'There is no such thing as a scale' (1995: 33). As Latour (1993: 122) observes the mistake that has been made has been to '. . . define the local only by contrast with what we think we have to attribute to the global, and vice versa'.

We know that global, national and local scales do not exist as such (they are intuitive fictions just like any other scales of whatever name: regional, macro, meso, micro, world, supraregional, state, community, individual, urban, city, etc.), and it is perhaps better to conceptualize world geographies, geographies of global change, globalization and urban geographies as a *skein of networks*. As ANT theorists like Latour (1993: 122) imagine, '. . . the words "local" and "global" offer points of view on networks that are by nature neither local nor global, but are more or less long and more or less connected'. Latour's point here is not to mistake '. . . length or connection for differences in [scale] level', nor to believe that such things as people, ideas, and situations are 'local' while others like organizations, laws and rules are 'global' (Latour, 1993: 120). Indeed, we might also add that it would be a mistake and in fact rather ridiculous to assume that the local is somehow concrete, while the global is somehow abstract (Thrift, 1993).

So, the basic point is that the shift from the idea of systems of cities (Bourne and Simmons, 1978) and hierarchies to the idea of networks of cities (Beaverstock *et al.*, 2000a) is not quite enough. This is because ANT requires you to imagine world cities as embedded in networks that are more or less long, more or less durable, more or less fast, and more or less connected. However, even more than that, and what is perhaps the most interesting idea for empirical world city research now, is that ANT requires

world city researchers to consider networks as being constantly made by *both human and non-human actors*. In other words, for us to give a great deal of consideration to what Latour (1987) calls the 'immutable mobiles' (e.g., vessels (Law, 1986), texts, technical artefacts, money, human beings) that make up networks. Immutable mobiles are what can be transported and mobilized without changing their form. In other words, immutable mobiles are durable and this is important because it is only the mobilization of immutable mobiles through delegation that the networks that weave together world cities can be made. In other words, *immutable mobiles are methods of long-distance control and consequently are vital to networks*. With ANT, world city scholars can get at the finer details of how networks really work over distance. Furthermore, with ANT we can make the important switch from studying the nodes in a city network to studying the links between those nodes in a different way to Beaverstock *et al.* (2000a; 2000b). This is because ANT requires us to look closely at the traffic, the immutable mobiles, that travel through and in so doing make networks. Indeed, the interesting idea that can be researched by world city scholars is that *the nodes and the links are made by that which passes through them*. In other words, nodes and links (world city networks) are not viewed by ANT as empty infrastructures that are subsequently filled by immutable mobiles.

In short, Latour insists that you never cross any lines or somehow switch between geographical scales when, for example, you follow a firm's network of operations around the world. Furthermore, this rejection of geographical scale reinforces the point that there is nothing abstract or alien about networks. Global networks are not superlunar objects made of something different to sublunar local relations. What ANT makes empirically clear is that networks are 'not made from some substance different from what they are aggregating. No visible or invisible hand suddenly descends to bring order to dispersed and chaotic individual atoms' (Latour, 1993: 121–22). This recognition takes us on to the ideas of Thrift who has been trying to get us to abandon those detached and abstract approaches to cities that have tended to reduce cities to mysterious and untouchable processes and forces like 'capitalism', 'imperialism', 'patriarchy' or 'globalization'.

For Castells, globalization is a meta-narrative and cities and networks are reducible to 'surface appearances' that are ultimately subject to the underlying deep structures and forces of political economy. Castells' neo-Marxism is trapped within a realist epistemology and consequently the visible city is reduced to structural forces, processes and socio-economic relations: capital flows and class antagonism in particular are seen as fundamental axioms. However, Thrift has been making the argument that we need to consider the role of agency, mobile practices, performativity and contingency to the formation and function of world cities. He is right, because people and practices are some of the intermediaries (Callon, 1991) or immutable mobiles who facilitate circulation and therefore help keep world city networks alive.

2   Thrift's non-representational theory: mobile practices and performativity

I always try to think of cities as performative, as *in use*, and therefore I see urban landscapes as essentially incomplete and only rarely in the hands of just one network of association.

Thrift (2000a: 234)

Thrift is famous in world cities research through his research on international financial centres (Thrift, 1994) and the City of London in particular (Thrift, 1996; 1998b; Thrift and Leyshon, 1992; Leyshon and Thrift, 1997). However, little attention seems to have been paid to his non-representational theoretical approach (Thrift, 1996, 1997, 1999a), and this is particularly odd given that it is this approach that is the basis for his research on both cities (Thrift, 1995; 1996; 1998a; 2000a; 2000b; 2000c) and business (Thrift, 1998c; 1998d; 1999b; 2000d; 2001). Here I will do no more than introduce Thrift's theory in order to encourage discussion of the merits and pitfalls of Thrift's non-representational approach to cities as a way forward for research into world city networks.

Developed by Thrift (1996; 1997; 1999a; 2000a), non-representational theory is a new direction in human geography that intersects and resonates with some of the concerns of poststructuralist theory (the work of writers such as Deleuze, Foucault, Guattari, Lacan), actor-network theory (the work of ANT writers such as Callon, Latour, Law, Serres), and theories of practice (the work of writers such as Hägerstrand, Heidegger, Wittgenstein, Merleau-Ponty, Bourdieu, de Certeau) to produce a new way of doing human geography that is committed to mobile practices and notions such as performance (Thrift, 1997; 2000a; Rose and Thrift, 2000a; 2000b). Thrift's (1996: 9) basic idea is quite simply that he is against what you might call the theoretical purification of practices and is therefore trying to:

> ... get away from Cartesian intellectualism, with its understanding of being as a belief system implicit in the minds of individual subjects, and return to an understanding of being as 'the social with which we are in contact by the mere fact of existing and which we carry with us inseparably before any objectifications' (Merleau-Ponty, 1962: 362).

In other words, while sometimes we frame representations, sometimes we do not (our actions are unformulated if sensitive to our situation and goals) and so an understanding of the subject in practice is, Thrift contends, fundamental to the making of human geographies. Furthermore, Thrift argues that we precisely need to be aware of practical intelligibility and inarticulate understanding, because that is the background through which the representations we make become comprehensible. In short, the outcome of Thrift's critique of representation is that the emphasis of human geography should be on practices – either on their reproduction, or the production of new practices – because it is practices rather than representations that are at the root of the geographies that humans make every day. It is this emphasis on practices that has led Thrift to ideas about performance and an interest in research on such practices as dancing as a way to think about the body (embodiment) and the city (e.g., see Foster, 1996; Thrift, 2000a; Thomas, 1996).

In some respects Thrift's work can be seen to be like M.P. Smith's work on *Transnational urbanism* (2001) which also advocates (if rather more crudely) 'agency-oriented urban theory' (p. 6). Smith draws on the ideas of Foucault and Laclau and Mouffe to, like Thrift, critique the usual suspects of urban theory (i.e., Harvey, Castells, Sassen, the LA School) whom he sees as concentrating on the macro-scale to the neglect of the micro-scale where practices are seen to happen. Smith's overall aim then is to '... place the study of urbanization and urbanism squarely within an agency-oriented theoretical perspective that concretely connects macro-economic and geopolitical transformations to the micro-networks of social action that people create, move in, and act upon in their daily lives' (2001: 6). Like Smith, Thrift is concerned that urban

theory has tended to downgrade and underestimate the importance of everyday human practices in our understanding of cities. However, the difference between the authors is that Thrift is concerned not simply about agency but also with the embodied and performative aspects of human practices, because so much 'agency cannot be captured by linguistic representation' (Thrift, 2000a: 246). This is the key point, because what is undoubtedly crucial to the functioning of cities (and business – see Thrift's work on tacit knowledge and 'soft capitalism'), and I would suggest the creation and maintenance of world city networks, is *that which is not written down and so consequently rarely recorded*. The myriads of networks to which cities belong are in part produced and reproduced through quite specific as yet unrepresented human practices that function to produce or strengthen connection(s).

In short, Thrift is concerned with the non-representational aspects of human life, that is with '. . . embodied non-cognitive activity which is the mainstay of how we go on' (Thrift, 2000a: 234). This interest in non-representation embraces a whole host of authors (see Thrift, 1999a, for his list of intellectual inspirations) including the thought of the poststructuralist philosopher Deleuze, who is famous among other things, for his interest in movement and flow. With Deleuze we 'look only at the movements' (Deleuze and Guattari, 1983) and this idea has been developed and extended by Thrift to argue for the need for an approach to cities that is aware of agency, embodiment, practices and performance. Overall, by drawing on a wide range of writers, Thrift is encouraging us to *begin to think about cities as networks of relations that are alive and brimming with movements, practices, performances and contingencies*. Thrift's focus is on relations because it is 'Relations which *perform*. Perform agency' (Callon and Law, 1995: 485).

V   Conclusions

> The word network indicates that resources are concentrated in a few places – the knots and the nodes – which are connected with one another – the links and the mesh: these connections transform the scattered resources into a net that may seem to extend everywhere. . . . The notion of network will help us to . . . understand how so few people may seem to cover the world.
>
> Latour (1987: 180)

There is much more yet to say about the idea of world city actor-networks (and about related matters such as world city topologies (see Smith, 2002), etc.), about how it is that so few people can seemingly (and seamlessly) cover the world. Here an introduction to the idea of world city actor-networks specifically for world city researchers has been outlined. By juxtaposing ANT and non-representational theory to several literatures – the existing literature on globalization and world cities (writers like Friedmann and Sassen); the relatively new relational approaches to cities (advanced by Massey and followed by others); the recent ideas in social anthropology about cultural flows (the work of writers like Ong and Hannerz); the neo-Marxist ideas of Castells; and recent empirical advances around the idea of networks in the field of globalization and world cities (the work of Beaverstock, Smith and Taylor in particular) – the paper has opened up urban geography to ANT, and highlighted the potential of Thrift's non-representational approach to cities. In short, the consequences of this paper are wide-ranging for how we think about and undertake empirical research into how world city networks function and are maintained over distance. The shift to considering spaces of intercon-

nection (such as networks) and the materials, people and practices that make up this or that spatial ordering is, I think, necessary if we are to better understand the relations between the world's cities.

To conclude, this paper will point to some directions for future research into world city actor-networks. First, what types of networks should we study? Most research in the field of globalization and world cities has been on hierarchies and has been economic (from Hymer to Reed to Friedmann to Sassen, etc.). Furthermore, the recent work on networks has also tended to be economic (e.g., see the emphasis of the majority of the work of the Globalization and World Cities Study Group and Network). In other words, we do still need to do more research on, for example, the cultural, social and political networks that bind cities together. Second, we need to do more research on what Massey (1999) has termed the power-geometry of networks: on the asymmetry of the actor-networks that link together cities. Third, what kinds of networks should we study? Well while I have argued that we should not just study economic networks, I think we should also not just study people and the stretching of social relations (as Massey argues), but rather how a network is made, maintained and functions to produce control (power-geometry) over distance. In other words, how the mobilization of materials, and the practices of people, stitch together the networks between cities: *we need to consider humans and non-humans to understand networks*. Finally, in light of ANT and non-representational theory we need to expand the number of qualitative methodologies we follow (add to Beaverstock *et al.*, 2000b: ethnomethodology is one of the most promising starting-points for studying actor-networks) and develop to get at just how city networks are, and are not, able to lengthen and function.

Acknowledgements

Notes

1.   World cities should not be confused with the idea of global cities. The 'world city' is a term that originated with Geddes back in 1915 and can be applied to dozens of cities. However, world cities should not be confused with the world's cities, which would include megacities and ordinary cities. The idea of the 'global city' gained wide currency much more recently in 1991 following the publication of Sassen's book entitled *The global city,* and refers to just three cities: New York, London and Tokyo. However, the term was used before this. For example, Naisbitt and Aburdene predicted that 'In the year 2000 . . . the truly global cities will not be the largest; they will be the "smartest"' (1990: 285). However, for the purposes of this paper, global cities are simply seen as world cities within networks.

2.   The idea of cities as networks is a metaphor that is deployed to make unrepresentable urban space intelligible and negotiable for certain ends. This metaphor undoubtedly has its limitations, blind spots, and consequences, but then so do all the other metaphors and analogies that have been deployed over the years. Examples include city as organism and disease (e.g., the Chicago School), city as machine (e.g., Corbusier's high modernism), city as system (e.g., Bourne and Simmons, 1978), city as text (e.g., Donald, 1992), city as world (e.g., Hall, 1966) and city as global (e.g., Sassen, 1991). The main worry I have about the idea of cities as networks is that the metaphor has become too tied up with recent advances in technology. Recently there has been much said about the digital city, the

information city, the TeleCity, the cyborg city, the figured city, the cybercity, the virtual city, the virtual urban area, the virtual metropolis, the transphysical city, the city of bits, the imploding city, the overdimensionalized city, the ageographical city, the Simcity, the real-time city and even the end of the city (though not in Pol Pot's sense!). However, as appealing as it may be to imagine living 'without cities', or in cities transformed by information technologies, the danger is that such ideas tend to marginalize 'the urban question' from political discourse.

3.   And poststructuralist theory itself, but there is not enough space here to consider, for example, Deleuze's rhizomatic thought about space and flows. These differ dramatically to Castells' ideas about the 'space of flows' and would certainly add to a new conceptualization of the multiple spaces and times (the folds, or topologies as Serres would say) of world city actor-networks (see Smith, 2002).

4.   An edited book entitled *Global-city regions* has recently been published from the conference (Scott, 2001). Another book with the same main title has also been published (Simmonds and Hack, 2000).

5.   A recent report (Corporation of London, 2000) on New York and London is quite limited in that it is just a comparative study of the economies of London and New York. The study compares the general characteristics of the two cities such as demography, and specifically their financial services, business and professional services, tourism, media, transport and governance. However, the study neglects the relations and networks between the two global cities which also make them what they are. In other words, the report does not seem to recognize that global cities, and New York and London in particular, are always both here and there.

6.   It is undoubtedly the case that ' . . . the centers of two cities are often for practical purposes closer to each other than to their own peripheries' (Mulgan, 1991: 3), and indeed Law and Hetherington (2000: 36) have noted that, 'In important respects the City of London is closer to Wall Street than it is to inner-city Salford'. This point has also been identified by Thrift (1995: 31), who notes that 'Just a few miles from South Central are the recently constructed corporate towers of Los Angeles's financial district, a place with all the necessary connections with telecommunications networks that are long and interconnected all around the world. It is a district that is nearer in this network time and space to New York, or London, or Tokyo than it is to South Central.' Networks are, and access to them is, always of course unequal, and the now almost cliché example in the literature is that of the unequal geography of access to the internet (e.g., Warf, 1999).

7.   There are many critiques of Castells' work. Crabtree (2002) observes that four of the most common criticisms are: (1) his use of language which many find bewildering; (2) his lack of precision in the use of examples which are often highly selective; (3) a lack of clarity over the explanatory power of his concepts; and (4) the grand form of his social theory ranging over virtually every conceivable topic and in so doing producing ' . . . an all-encompassing narrative into which all examples seem to fit' (2002: 52).

8.   Emerging from poststructuralism, both ANT and non-representational theory are anti-humanist and so reject a subject-centred epistemology. Thus, the interest in people and practices in these approaches should not be seen as a return to humanism, but rather as a further advance of the poststructuralist critique of the subject.

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