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Abstract

In this paper we explore what assemblage thinking offers social-spatial theory by asking what questions or problems assemblage responds to or opens up. Used variously as a concept, ethos and descriptor, assemblage thinking can be placed within the context of the recent 'relational turn' in human geography. In this context, we argue that assemblage thinking offers four things to contemporary social-spatial theory that, when taken together, provide an alternative response to the problematic of 'relational' thought; an experimental realism orientated to processes of composition; a theorisation of world of relations *and* that which exceeds a present set of relations; a rethinking of agency in distributed terms and causality in non-linear, immanent, terms; and an orientation to the expressive capacity of assembled orders as they are stabilised and change. In conclusion, we reflect on some further questions of politics and ethics that follow from our account of the difference assemblage thinking makes to relational thought.

Key words: Assemblage, network, relationality, agency, excess

On Assemblages and Geography

Introduction

Recent years have witnessed a remarkable proliferation in social scientists'

use of the term assemblage, as one part of a broader 'relational turn'. Within

human geography alone, the term has been variously used as a broad *descriptor*

of different historical relations coming together (e.g. Cowan and Smith, 2009, on

the 'geopolitical social'); as an *ethos* oriented to the 'instability' of interactions,

and the concomitant potential for novelty and spatiotemporal difference (e.g.

Allen and Cochrane, 2010; McGuirk and Dowling, 2009); and as a *concept* for

thinking the relations between stability and transformation in the production of

the social (e.g. McFarlane, 2009; Swanton, 2008)[1]. Given the popularisation of

assemblage in relation to a diverse range of substantive topics, issues and

concerns, the phrase 'assemblage geographies' (Robbins and Marks, 2009) names

the diverse energies gathered together across these and other uses (see Anderson

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[1] The relation between the French word *agencement* and assemblage in English is vexed. There is no precise English translation of the French word *agencement*, and it is widely agreed that assemblage is not a good approximation (Law, 2004; Phillips, 2006). For example, Phillips (2006: 108) argues *agencement* implies arrangement and connection, with the word connoting 'arrangement', 'fixing' and 'fitting'. He continues, suggesting that 'the English word assemblage means much the same as *assemblage* in French – connoting blending, collating, gathering and joining', and in French it is usually associated with more technical vocabularies (*ibid*: 109). Elsewhere, Callon and Caliskan (2005) have suggested that *agencement* is a deliberate wordplay on *agencer* (meaning to arrange or fit together) and *agence* (meaning agency). This play on words is significant, opening up productive ways of thinking about matter and distributed notions of agency (Bennett, 2004; 2005).

and McFarlane, 2011). Alongside the ever expanding range of assemblage geographies, new forms of spatial politics are beginning to emerge, including opening up the political potential of becoming (e.g. Ruddick, 2010, on 'emancipatory assemblages'), experimenting with new relations with life (Hinchliffe, 2007), and tracing the specific associations through which forms of power endure (e.g. McCann and Ward (2011) on policy mobilities).

The paper's purpose, then, is a straightforward one: to step back from the increasing use of assemblage within geographical debates and to attempt to take stock of what assemblage thinking offers social-spatial theory. By focusing on the problem space opened up by assemblage as agencement, we argue that what is novel about assemblage is the claim that 'relations are exterior' to their terms. As such, we show that assemblage thinking is a distinct response to a series of emerging tensions and problems in 'relational' thought: the set of partially connected theories that claim that entities acquire their form, efficacy and meaning by virtue of their position within some form of relational configuration. This point is now a familiar one. Indeed to argue or assert that an entity, indeed any entity, *is* relational, and/or is emergent *from* relations and/or take place *in* relations is perhaps the starting point and sometimes even the main claim of contemporary social-spatial theory (Harrison, 2007; Lee and Brown, 1994). For us the risk is that it may become too familiar. Rather than a provocation that forces us to think again, relational thought risks becoming a routine to be mastered and repeated. The danger is that in offering a 'relational' account of the social, it is

easy to stop short of a set of subsequent questions: How might we attend to the plurality of relations that might differ in both nature and kind? Are relations internal or external to their terms? Can relations change without the terms also changing? Are actual entities exhausted by their position within relations? How can we understand what we could term 'events' that may break, interrupt or change relations, and may initiate the chance of new relations? (Anderson and Harrison, 2010: 15).

It is in relation to these and other questions about the status of 'relations' that we think assemblage thinking offers something unique and of significance. By beginning from the claim that 'relations are exterior to their terms', assemblage thinking allows us to foreground on-going processes of composition across and through different human and non-human actants; rethink social formations as complex wholes composed through a diversity of parts that do not necessarily cohere into seamless organic wholes; and attend to the expressive powers of entities (Bennett, 2005; Gidwani, 2008; Latour, 2005; Ong, 2007). More specifically, in our own research we have engaged with assemblage as a word, concept, and ethos to think through three conceptual problems inherent in the now commonplace claim that the social is 'relationally constituted'[2].

First, how to avoid the naturalization of one or more socio-spatial forms or socio-spatial processes given the diverse types of space that have now been

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[2] Our research spans domains as different as science and technology, informality and infrastructure, anticipatory techniques and the politics of affect, urban multiculture and industrial remains.

disclosed by relational work – territories, fluids, networks, foams and other spheres, flows, regions, rhizomes, fluids, scales and so on? As four geographers working in different substantive areas, part of our attraction to assemblage thinking is that it does not point to any particular spatial imaginary. An assemblage approach demands an empirical focus on how these spatial forms and processes are themselves assembled, are held in place, and work in different ways to open up or close down possibilities. In short, assemblage provides a useful purchase on processes of composition, allowing us to understand how spatial forms and processes are held together, often with degrees of internal tension, and might have been assembled otherwise.

Second, how do we reconcile the systematicity of certain orders on the one hand, and change and emergence of new orderings on the other? We have tried to use assemblage in our own work to address this problem. For example, we might think here of how infrastructure in many cities is subject to economies of repair, maintenance, disruption, and breakdown, necessitating complex inter-relations of expertise, learning, capital (dis)investment, policy and regulatory frames, and material reconfiguration. Assemblage thinking allows us to attend to how these often disparate activities become entangled with one another, but nonetheless have potential agency beyond those interactions which may later become parts in other assemblages. To give another example: we could think here of how a form of anticipatory action such as pre-emption in U.S.A counterterrorism policy is constituted through the redeployment of elements

from other ways of acting over futures as well as the intensification of dormant tendencies in linked areas of public policy. Pre-emption emerges as a coherent and distinct way of reordering space, even as it is always involved in a series of partial connections with other ways of acting over threats and hazards. What assemblage offers, then, is a sustained account of the different ways in which orders endure across differences and amid transformations, in addition to a sensitivity to how orders change and are reworked.

Third, and following this, how do particular sets of relations appear to hold together across multiple differences and contradictions, even in what appears to be incoherent relations? For example, we might consider how assemblage can re-orientate understandings of race by focusing analysis on iterative performances of social differentiation in moments of encounter. This focus enables us to view race as simultaneously fluid and fixing; assemblage allows for the different and oftentimes contradictory ways in which race comes to matter without denying the tendency for race to fall back into relatively stable forms and relations (Saldanha, 2006). While maintaining a conception of the relational and embodied investment in differentiation, for Saldanha, Swanton (2010) and others assemblage helps understand how the category of race is, at least for a time, stabilized as a provisional formation composed of a diversity of human and non-human parts that act together.

These three problems and some of their associated questions emerge as puzzles in the paper as we work through how assemblage has been deployed

variously as a *word* to describe one way amongst others in which orders cohere, a *concept* that directs attention to processes of *agencement*, and an *ethos* sensitive to difference, heterogeneity and indeterminacy. Our aim, then, is to explore the problem-space that surrounds the term rather than critique other uses or advocate some form of unified theory of social-spatial processes and forms.

We develop our approach over four sections. In section one we consider different uses of assemblage as word, concept, and ethos in order to draw out what we see as the promise of thinking with assemblages: an openness about spatial form that follows from an experimental stance that is attentive to how provisional orderings cohere in the midst of and through ontologically diverse actants. Accordingly, we also question the ways in which concern with active processes of *formation* has in some, but not all, uses of assemblage been substituted by an identification of particular kinds of assembled forms. Our concern here is that the term assemblage is used simply to designate a new form of socio-spatial organisation in a way that drains this terminology of its dynamic potential and its attentiveness to the often uneven and uncomfortable practices of composition. Section two, explores the 'exteriority of relations' and details the ways in which assemblage theory differs from other forms of relational thinking, notably some versions of actor-network theory. In section three we examine how this emphasis on the exteriority of relations invites a re-thinking of distributions of agency and, in particular, the issue of causation. Section four develops the emphasis on non-linear causality in section three by taking up the problem of

how assemblages endure as real entities and how they transform. We conclude by reflecting on further questions about ethics and politics that follow from our account and summarise the difference thinking the 'exteriority of relations' makes to relational thought. By finishing with these questions, we hope assemblage remains a term that forces, invites or enables thought – rather than becoming a routine, a set of procedures and protocols, to be mastered and repeated. In his translator's foreword to Deleuze and Guattari's *A Thousand Plateaus* Brian Massumi (1988: xiii) writes: "A concept is a brick. It can be use to build the courthouse of reason. Or it can be thrown through the window". Massumi's argument is that a "concept has no subject or object other than itself" (*ibid*). Rather, concepts are acts. It is in this spirit that we think with assemblage.

Composition and an ethos of experimentation

In this section we examine how assemblage provides a distinct way of conceptualising the relations between entities and their constituent elements. Though the primary focus of this section is on conceptual uses of the term assemblage, we begin by reviewing the range of meanings that this terminology has in different traditions. We do so in order to highlight a tension in assemblage thinking: between treating assemblage as a distinct form and treating assemblage

as an ongoing process of agencement through which form emerges and may endure.

Assemblage terminology traverses, and draws insight from a range of disciplines, including archaeology, geology, ecology, and art (see Phillips, 2006; Venn, 2006). In these contexts the term assemblage provides a conceptual repertoire for classification and categorization. In archaeology, the term is used, in the main, to refer to a group of different artefacts found in association with one another at a particular site. In ecology, there is a similar use. Assemblage refers to a taxonomic subset of a community; where a community is a collection of species occurring in a specified time and place. Assemblage, specifically, names the phylogenetically related members of a community (for example, all mammalian species in a given place at a given time). In art theory, we find a slightly different use. Assemblage has become synonymous with pastiche, montage, and collage. But when first used by Jean Dubuffet in 1953, it referred to a 3D sculpture consisting of found objects arranged to create a piece.

Assemblage operates as a technical term that enables heterogeneous phenomena to be classified and ordered. In relation to ecology, art, and archaeology the form of association is already-always delimited. An order is provided by taxonomic criteria, by the unity of a piece or work, or by the space of a site. In each case the term continually blurs into other similar terms. Assemblage blurs with ensemble, community and guild in ecology and with montage, pastiche and collage in art, for example. But in each of these technical

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usages, assemblage is deployed as a tool of classification that delimits some form of grouping from another grouping.

Of course, there is something of a leap from these diverse deployments of the term to its more recent articulation in contemporary social-spatial theory. Nevertheless, it does remind us of a risk implicit in using terms such as assemblage, and other linked terms such as network, to name relational configurations; that form replaces formation, assemblage as noun replaces assemblage as verb. For the most part, such a use relies on taken-for-granted dictionary definitions of the term (see Sassen, 2006). It loses sight of what we take to be the key starting point of an assemblage based analysis of the social: to understand assembling as an ongoing process of forming and sustaining associations between diverse constituents. Two brief examples help illustrate what such an approach offers by showing how assemblage has been utilised to describe formations composed of different kinds of entities or processes. What is emphasised in an assemblage based analysis is the heterogeneity of their component elements and the specific 'style of structuration' (Bennett, 2010) through which seemingly well ordered formations hold together.

First, McGuirk and Dowling (2009: 176) use assemblage to challenge the tendency in critical urban studies and political geography to interpret (or 'read down') political-economic and social change in cities from abstract features of 'neoliberalism in general'. Focusing on contemporary residential developments (masterplanned residential estates) in Sydney, Australia they resist the tendency

to cast such developments as "iconic expressions of urban neoliberalisation" (*ibid.* 174) – and the inclination to mobilise neoliberalism as a pre-constituted theoretical explanation of urban phenomena' (*ibid*. 178). McGuirk and Dowling (2009: 178) use assemblage to emphasise that master planned residential estates are social formations borne of 'multiple projects and rationales' that "are realised through diverse assemblages of institutions, actors and practices". Assemblage enables McGuirk and Dowling to describe the provisionality of housing developments – in contrast to the singular story of neoliberal retreat – and how these developments are the 'less than coherent' outcomes of interacting practices, actors and institutions.

Second, assemblage has been used to question how geographers understand race as a social formation and category of identity and difference (Saldanha, 2007; Swanton, 2010). For example, Saldanha's (2007) research on white ravers on a Goan beach seeks to challenge the conventional framing of race as a social construct. Saldanha (2007) couples the concept of assemblage with other concepts (face, embodiment, location, and viscosity) to account for the emergence of race on the ground in interaction. Rather than a social construct – where race is primarily understood as ideas and representations to be struggled over – Saldanha sees race as "a heterogeneous process of differentiation involving the materiality of bodies and spaces…shifting amalgamation of human bodies and their appearance, genetic material, artefacts, landscapes, music, money, language, and states of mind" (Saldanha, 2007: 9). Assemblage allows

Saldanha to describe the provisionality of race, emphasising how race takes form through the connections between heterogeneous components (bodies, things, practices, contexts…) in particular moments. Saldanha draws on assemblage to both account for the relative stability of race as a social formation (where order is a 'shifting effect of many little connections and flows') without negating the possibility that things might be otherwise; indeed his core argument is that anti-racist politics should be concerned with proliferating race – with multiplying its meanings and affects – rather than eradicating race.

In the examples of neoliberalism and race, assemblage terminology speaks of the processes of composition that produce durable orderings and of the ontic indeterminacy of what might ordinarily be thought of as totalising practices and processes. Notwithstanding differences in conceptual terminology, what the examples have in common is a particular ethos of engagement that accompanies thinking with assemblages: an ethos of engagement that attends to the messiness and complexity of phenomena; an ethos that is committed to process-based ontologies that challenge conventional explanations by focussing on materially diverse configurations; and an ethos that emphasises the open-ended, unfinished nature of social formations. Whilst not using the term ethos, Marcus and Saka (2006) characterise something similar when they argue that assemblage thinking brings together two seemingly contradictory ways of understanding social order: the ephemeral and the structural. The result, for Marcus and Saka (2006: 102), is that working with assemblages is characterised by 'almost a nervous condition':

Indeed, the term [assemblage] itself in its material referent invests easily in the image of structure, but is nonetheless elusive. The time-space in which assemblage is imagined is inherently unstable and infused with movement and change…Whoever employs it does so with a certain tension, balancing, and tentativeness where the contradictions between the structural and the unstably heterogeneous create almost a nervous condition for analytical reason.

Assemblage certainly holds within it a sense of composition and instability, indeed we explore this dynamic below, but we suggest that Marcus and Saka's diagnosis overplays the 'contradiction' between the 'structural' and the 'unstably heterogeneous' by underplaying the extent to which assemblage works outside of a problematic of 'structure' (in particular if 'structure' is taken to be an extrinsic source of determination standing apart from, and determining, any actual occurrence). By attending to the 'ontological priority' (Massumi, 2002b) of processes of composition through which forms emerge (and may return), the term assemblage invites us to think outside of a distinction between the structured and the unstructured. Accordingly, we would phrase the condition that follows the use of assemblage somewhat differently: assemblage involves an 'experimental condition' for a social-spatial theory concerned with formation.

Obviously, the term 'experimental' comes with its connotations. The classical notion of the experiment refers to a method for testing hypotheses under controlled conditions. This is the exact opposite of what we mean here. We invoke the verb 'to experiment' as an ethos for understanding the durability of orderings (or collections of orderings) by tracing the relations between the heterogeneous elements that compose them, following how an assemblages as a 'co-functioning' itself may achieve effects and enter into relations with other assemblages, and mapping the encounters through which the elements within an assemblages are brought into contact with forces outside of them (see Anderson and Harrison, 2010; Bennett, 2005; McFarlane, 2011; Swanton, 2010; Saldanha, 2007). It has two characteristics. First, it involves an intervention designed to describe but also to interrupt and recast relations through what Stengers (2008: 109) calls "a practice of active, open, demanding attention ... to the experience as we experience it". Second, it includes a resistance to closure and encourages a stress on open-endedness around the emergent and the already formed. An example of how thinking with assemblage embodies this ethos of engagement is Swanton's (2010) montage of fragments to evoke everyday multiculture and performances of race. Here the juxtaposition of narrative fragments emphasise the messy, contradictory and unfinished nature of race as it takes form in encounters. In this sense the narrative style seeks to be more assemblage-like: it begins in the midst of things, and focuses on the taking form of race at particular moments. By focusing on composition, thinking with the concept of assemblage

enables an ethos of engagement with the world that is deliberately open as to the form of the unity, the types of relations involved, and how the parts will act.

The exteriority of relations

We can briefly compare the experimental orientation to processes of composition with other challenges to conventional forms of explanation that have followed the 'relational turn' to get a sense of its insight and significance. In particular, assemblage thinking enjoys some resonance with Jessop, Brenner and Jones' (2008) notion of 'sociospatial relationality'. For example, while they do not use the term assemblage, Jessop, Brenner and Jones' (2008) attempt to recognize the polymorphic, multidimensional character of social-spatial relations is framed by a similar conceptual problem - the reduction of social-spatial relations to one form. They identify four dimensions of social-spatial relations – territory, place, scale and network – each of which has an associated principle of socio-spatial structuration and an associated pattern of socio-spatial relations. Rather than privileging one of these four dimensions, Jessop *et al.* seek to draw them together in an attempt to develop commensurable vocabularies that would enable researchers to explore the differential weighting and specific articulation of each dimension in a given 'spatiotemporal context' (*ibid.:* 393). In some ways Jessop *et al.*'s piece is close to certain uses of the term assemblage; both involve a commitment, of some form, to realism and both offer a vision of a world riven by

volatility. However, there is one critical difference between this model and assemblage. Jessop *et al*. reduce social-spatial relations to a set of already known, recognised and agreed upon patterns, principles and forms. There is only limited room for patterns, principles, or forms that differ from these four dimensions. At best new combinations of the four may emerge as elements from each are differentially articulated, but there can be nothing that is genuinely new (and no theoretical account is given of articulation). Moreover, the critical category – and the most undeveloped one – concerns the 'spatiotemporal context' within which elements from the four forms are somehow articulated together. It is here that we find the key distinction with thinking social-spatial relations through the term assemblage. Assemblage privileges process of formation and does not make *a priori* claims about the form of relational configurations or formations. With assemblage the starting point is 'context' and the conditions under which provisional unities emerge from the agencement of heterogeneous phenomena, not a neutral frame within which a set of ideal forms are somehow articulated. What assemblage promises, then, is a sustained account of the specific ways in which orders emerge and endure across differences and amid transformations.

In discussion with Claire Parnet, Gilles Deleuze (Deleuze and Parnet, 1977) introduces a "vital protest against principles" (41), one that for us is at the heart of the difference assemblage makes to 'thinking relationally' and its promise as a concept for understanding durability and transformation in social orders. Deleuze's central claim is that "relations are external to their terms" (*ibid.* 41) (on

which see DeLanda, 2010). We see 'relations of exteriority' as a defining characteristic of assemblage that re-orientates our approach to phenomena by insisting on the autonomy of component parts. The idea is a strange one. Beginning from the affirmation that 'relations are external to their terms' involves standing apart from two more common ways of thinking relations and terms (when the things related could include people, objects, organisations and anything else). The first posits relations as a second-order connection between atomistic individual mediated through some form of contact or exchange. The second is that individuals are fully determined by their relations, meaning that a change in relation, no matter how small, changes the things related. But Deleuze offers an alternative. What kind of world is disclosed if we presume that a thing is conditioned, but not determined, by its relations and that relations therefore have autonomy from the terms related? Deleuze continues:

> If one takes this exteriority of relations as a conducting wire or as a line, one sees a very strange world unfold, fragment by fragment: a Harlequin's jacket or patchwork, made up of solid parts and voids, blocs and ruptures, attractions and divisions, nuances and bluntnesses, conjunctions and separations, alternations and interweavings, additions which never reach a total and subtractions whose remainder is never fixed.
>
> (Deleuze and Parnet, 1977: 41)

Later in his discussion with Parnet, Deleuze poses a deceptively simple question: What is an assemblage? Deleuze's answer helps us attend to the 'very strange world' that follows from his affirmation of the exteriority of relations. For Deleuze, the term assemblage describes the 'co-functioning' of heterogeneous parts into some form of provisional, open, whole. This definition may not sound very precise, but this is, in many respects, the point. An assemblage is a 'harlequin's jacket or patchwork' of different bodies that can never be reduced to a series of constituent parts nor identified as an organic whole. An assemblage is finite: an emergent effect of processes of gathering and dispersion.

What is an assemblage, then? Deleuze provides an outline of a definition in the following terms:

> It is a multiplicity which is made up of many heterogeneous terms and which establishes liaisons, relations between them across ages, sexes and reigns – different natures. Thus, the assemblage's only unity is that of co-functioning: it is a symbiosis, a 'sympathy'.
> (Deleuze and Parnet, 1977: 52)

For Deleuze, the 'unity' of assemblages is not that of an organic whole, or a total system, where different parts are smoothly or violently subsumed into homogeneity. It can therefore be distinguished from models of socio-political

composition that draw on organisimic metaphors. Broadly speaking organisimic models, current in systems theory, molecular biology and information theory, tend to reify a conception of the boundaries of the organism, be it social, biological or informational. In systems theory the organs of a social or biological system largely function to reinforce the boundaries of the organism. (Luhmann, 1995; Maturana and Varela, 1972; Oyama, 2000). Alternatively, for Deleuze, while maintaining a conception of the internal dynamism of assemblages, he directs attention to how, as he puts it, "all the elements of a non-homogeneous set converge, making them function together" (Deleuze and Parnet, 1977: 39). For Deleuze, the emphasis is squarely on the bringing together of heterogeneous entities into some form of temporary relation (or set of relations), without presupposing that these relations necessarily constitute an organism. Thus, an assemblage is both the provisional holding together of a group of entities across differences and a continuous process of movement and transformation as relations and terms change. Deleuze's use of terms with quite different genealogies - 'symbiosis' in the context of biological interactions and 'sympathy' in the context of the interpenetration of bodies that feel - to understand the 'unity' of an assemblage is instructive here (see also *ibid.* 40). As Deleuze (Deleuze and Parnet, 1977: 52) puts it: "It is never filiations which are important, but alliances, alloys; these are not successions, lines of descent, but contagions, epidemics, the wind". As such, Deleuze invites us to wonder about how

heterogeneous parts are assembled and orders hold together and endure both across differences and through differences.

For Deleuze and Guattari the notion of exteriority is a way of resolving the relation between composition and difference. In developing this notion of exteriority Deleuze and Guattari draw on notions of *compositionism* developed originally in Italian Autonomist Marxist thinking in the 1960s and 70s (Wright, 2002). Characterized as the 'workerist movement', or what become known as the *operaismo,* one of the central aims of Italian autonomist Marxist thought was to

> identify, within the larger Marxist tradition, a variety of movements, politics and thinkers who have emphasized the *autonomous* power of workers – *autonomous* from capital, from their official organizations (e.g. the trade unions, the political parties) and, indeed, the power of particular groups of workers to act autonomously from other groups (Cleaver quoted in Wright, 2008: 116, emphasis added).

Accordingly, autonomist thinkers developed the notion of 'class composition' as a new expression of the organisation of class struggle that maintained the autonomy of both individuals and new revolutionary groupings. Whilst emerging from other genealogies, contemporary assemblage theory resonates with the practical problematic of the autonomists, seeking to develop an alternative conceptual repertoire to organisimic models of relationality which,

though based on a range of systems or network metaphors, conceptualise the functionality of parts as determined by heretical relations with an organic whole. To invoke the term assemblage is to orientate inquiry to how 'open ended collectives' (Bennett, 2010) are temporarily achieved in a world of differences, and how they may endure and may transform without the heterogeneous elements that compose them ever adding up to an organic whole.

For this reason, we see close resonances between assemblage and some versions of actor network theory – after all, Latour (2005) has suggested that actor-network theory tells us nothing at all about the form of relations *a priori* to the work of tracing associations. In Latour's (2005) attempt to recast actor-network theory in terms of Tarde's associationist sociology, the term network is orientated toward what Latour describes as 'traceable connections' whereby pockets of social order are precariously stabilised against "a much vaster backdrop of discontinuities" (ibid. 245). Both Latour's actor-network theory and assemblage theory are framed by ambivalence toward the a-priori reduction of social-spatial relations to any fixed form or set of fixed forms – the micro and macro forms of reductionism introduced above. And both invite us to be open to how social-spatial relations are patterned and structured through what Bennett (2010: 23) refers to as "ad hoc groupings of diverse elements, of vibrant material of all sorts ... living, throbbing confederations that are able to function despite the persistent presence of energies that confound them from within". Spatial forms – such as scales, regions, or territories – emerge from the 'co-functioning' of

heterogeneous materials (and various processes have been described in order to understand the emergence of the metric from the topological).

Assemblages, like actor-networks, are provisional unities that may themselves have an 'emergent' or 'complex' causality that is irreducible to their component parts. Whilst it is fair to say that assemblage theory shares an initial orientation with Latour's version of actor-network theory it would, we think, be a mistake to see assemblages as the proper 'object' for an 'after' actor-network theory literature (even though the terms assemblage and network are often used interchangeably). When deployed as a concept, rather than word or ethos, assemblage makes some original claims about relations and their terms. Rather than conceptualise assemblages as seamless wholes the notion of the 'exteriority of relations'

> implies a certain autonomy for the terms they relate, or as Deleuze puts it 'a relation may change without the terms changing'. Relations of exteriority also imply that the properties of the component parts can never explain the relations which constitute a whole, relations do not have as their causes the property of the [component parts] between which they are established…' although they may be caused by the exercise on a component's capacities.
>
> (DeLanda, 2006: 10-11)

So what is at stake when we talk of assemblages defined by 'relations of exteriority'? While other modes of thinking relationally view entities as syntheses, where 'the linkages between its components form *logically necessary* relations which make the whole what it is', assemblage theory views relations as *contingently obligatory* (DeLanda, 2006: 11). So, for example, via the labour of tracing associations actor-network theory seeks to relate humans and non-humans in their co-production of the world. And in this work of relating the properties of parts – objects, artefacts, technical practices, humans, and so on – form *logically necessary* relations in the constitution of an actor-network. In DeLanda's vocabulary the actor-network becomes a 'seamless whole' that fully assimilates its component parts; nothing stands outside the descriptions that actor-network theory performs (Hetherington and Law, 2000: 128; Lee and Brown, 1994). The problem is that seeing entities as fully determined by their present relations makes it difficult to understand the efficacy of 'parts' by making the relational configuration into a homogeneous whole.

Latour (2005) hints to precisely the problem of how to think an 'outside' to relations. Alongside associations, he invokes the "strange figure of plasma" (*ibid.* 50, n 48) a figure coined to stand for "that which is not yet formatted, not yet engaged in metrological chains and not yet covered, surveyed, mobilized, or subjectified" (*ibid.* 244). By invoking a vast 'unformatted' realm from which associations emerge Latour offers one figure of an outside to relations. By contrast, beginning from the 'exteriority of relations' avoids invoking a

distinction between formatted associations and a vast unformatted realm. For DeLanda (2006) relations are *contingently obligatory*: entities are affected by relations and by the other terms they are related to but they are not fully determined by those relations/terms (see also Harman, 2008). On the one hand, entities can be detached from any one assemblage to become parts of another assemblage. On the other, entities are never fully actualised within any of the relations that constitute an assemblage. Here a distinction between the properties and capacities of entities is critical, and this distinction underpins the attempt to understand the relations between parts and wholes in assemblages. Where the properties of a part are given and known (or knowable), capacities are open and unpredictable. Properties refer to actual, real, states of affairs. By contrast, capacities form an open-ended set of potentialities that cannot be deduced from properties since: "These capacities do depend on a component's properties but cannot be reduced to them since they involve reference to the properties of other interacting entities" (Delanda, 2005: 11).

Jane Bennett's example of a 2003 blackout in North America where a cascade of events left 50 million people and 24,000km^2 without electricity helps illustrate these arguments out the exteriority of relations and the importance of the capacities of a component element or part. Bennett argues that viewing the grid as a machine or tool – "as a series of fixed parts organised from without that serves an external purpose" (Bennett, 2010: 25) – cannot adequately explain the blackout. Instead, the ordering of heterogeneous elements and flow of electricity

through the grid is an achievement – an emergent effect and one "that endures alongside energies and factions that fly out from it and disturb it from within" (Bennett, 2010: 24). The blackout illustrates the provisionality of the grid as a series of minor happenings (including routine generator withdrawals and a bush fire) radically transform the interactions between the component parts producing a dissonance that meant cooperation became impossible and the grid failed. The point here is not that the properties of the component parts of the electric grid changed, but their capacities. As generators are unplugged from the assemblage and wire-tree encounters plugged in, the interactions between component parts and more specifically the capacities of diverse elements are transformed to the extent that the grid falls apart and a blackout temporarily takes place.

Bennett's example illustrates how capacities are two-sided potentials to affect other terms/relations and be affected by those other terms/relations. As such, all of an entity's capacities cannot be definitively named and known in advance. All that can be known is how specific capacities play out in relation to, or with, the properties and capacities of other entities. On this understanding, the distinction between properties and capacities is a way of avoiding a holism, or totalization, which would see entities as fully determined by their relations. Thinking in terms of capacities opens up a moment of indetermination in the morphogenic processes that compose assemblages, as well as allowing for the autonomy and agency of component parts. Through this framing of relations as contingently obligatory, and by focussing on the exercise of capacities that are

unknowable outside particular confederations, we can allow for (without assimilating) the 'co-functioning' of differences within assemblages.

Rethinking agency and causality

What assemblage thinking allows for, then, is a world populated with a motley array of entities with differing properties and capacities: infrastructures, buildings, unicorns, ideas, circuit boards, tears, air, handgliders, hatred, all are capable of acting and making a difference (on materiality see Anderson and Wylie, 2009; Latham and McCormack, 2004; Kearnes, 2003; Colls, 2007). There is no reason why this realism goes 'all the way up' as well as 'all the way down' (Shaviro, 2010). For example, might we learn to think of 'Society', for example, not only as an abstraction to be explained by reference to the parts that compose it, but as a real entity with expressive powers that is more than the sum of its parts? Following on from the affirmation that 'relations are external to their terms', in this section we examine the difference that thinking with assemblages might make to how agency and causality are understood. If assemblage as a concept and an ethos involves a theory of society "that suggests all entities result from a swarm of tinier subcomponents that do not melt into a seamless whole" (Harman, 2008: 367), where does this leave agency and causality? How might we conceive of how the 'elements' or 'parts' of an assemblage function in processes of composition? How might rethinking causality and agency allow us to consider

the dynamic between the durability of assembled orders and their transformation? We argue that assemblage thinking entails a focus not just on how agency produces resultant forms, but on how the agency of both the assemblage and its parts can transform both the parts and the whole. The implication of assemblage thinking is that causality is located not in a pre-given sovereign agent, but in interactive processes of assembly through which causality operates as a nonlinear process. This involves a distinct orientation to agency and causality in three broad and inter-connected ways.

First, as Graham Harman (2008: 367) indicates, the agency of assemblage must be understood through a 'doctrine of emergence'. Assemblages are shaped as they are made (Hetherington and Law, 2000: 131). Here, the agents of transformation or stability may be singular or multiple, large or small, within or outwith the assemblage, and their operation may be sudden or gradual. Assemblages shifts our analytic gaze from end-products to agents in "the transient crystallizations of a longer process" (Harman, 2008: 373; Li, 2007). Assemblage operates not just as a concept aimed at understanding how a set of relations emerge and hold together across differences, but as an ethos for thinking the relations between durability and transformation. This ethos does not, of course, equate to an understanding of all entities as ever-changing and unstable, but to how durability is sustained or not. Durability in social forms can be achieved through sedimentation, repetition or habit. But durability in form should not be confused with fixity. An ethos of assemblage eschews thinking in

terms of essence or fixity by holding onto the possibility that entities are continuously being formed and deformed. It's important here that in narrating processes of assembly, care is taken to attend to the forms of power through which particular relations are held stable, fall apart, are contested, and are reassembled. Otherwise there is a risk that non-transformation, failure, and obduracy may seem to slide from view (Harrison, 2007). Particular forms of transformation are often more likely than others. This is not to posit power as external to the assemblage, although the power of other assemblages to act upon one another is of course important, but to locate power as a contingent and multiple force in relation to which assemblages are made and remade.

Second, if assemblage focuses attention on the gathering together of entities, the concern with the exteriority of relations means that assemblage thinking is simultaneously concerned with the agency of component parts. What the rethinking of agency provides is a way of describing how different agents within the assemblage may possess different resources and capacities to act. We can illustrate this by contrasting the conception of agency in Karen Barad's work on 'phenomena' and Jane Bennett's work on the agency of assemblages. What Barad (2007) calls 'agential realism' is closely related to but not equivalent to what Bennett (2010) calls 'vibrant matter' – the recognition that agency lies in distributed processes of intra-active becoming, where materiality is as much energy, process, flow, and intensity as entity and extension. Barad (2007: 139) writes of 'phenomena' rather than autonomous parts as the primary ontological

unit, where phenomena refers to how humans or objects exist not within themselves but as co-constituting intra-action: "Phenomena are the ontological inseparability/entanglement of interacting 'agencies'". Barad's account of agency resonates with assemblage in that agency becomes a name for the ongoing reconfiguring of the world, rather than a property. Particular agential *intra*-actions condition phenomena and make certain articulations of assemblage meaningful (a theme we will consider more closely later). So, for example, matter comes to be understood not as a fixed substance, but as a "substance in its intra-active becoming – not a thing but a doing, a congealing of [human and nonhuman] agency" (Barad, 2007: 151; and see Colls, 2007). But while for Barad intra-action insists that distinct agencies do not precede, but rather emerge through, their mutual constitution – i.e. agencies don't exist as individual elements – assemblage thinking is more attentive to the autonomy of component parts. If in Barad's conception of phenomena the agency of parts dissipates in the focus on phenomena, in assemblage thinking parts retain an importance as autonomous actors that may or may not alter the nature of the assemblage. Again, assemblage operates not just as a concept that focuses on the co-constituting nature of different agents within assemblages, but as an ethos oriented to the agency of both the parts and the whole.

Jane Bennett (2010) uses Deleuze's notion of 'adsorbsion' to capture the agency of both wholes and parts in assemblage thinking – a gathering of elements in way that both forms a coalition and yet preserves something of the

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agency or impetus of each element. There are two key concerns here for assemblage thinking that emerge from the exteriority of relations and differ from Barad's position. First, component parts always exceed their current actualisations in an assemblage. Second, parts can be disconnected or plugged into a different assemblage in which their interactions are different, and these changes in the arrangement and interaction of parts have the potential to reconfigure an assemblage as new alliances are forged. This is not to say that an agent ever acts alone; agency for Bennett always depends on collaboration: "Each member and proto-member of the assemblage has a certain vital force...And precisely because each member-actant maintains an energetic pulse slightly 'off' from that of the assemblage, an assemblage is never a stolid block but an open-ended collective, a 'non-totalizable sum'" (*ibid.* 24). The emergence and transformation of assemblage – the first aspect of the agency of assemblage highlighted above – is sourced both from new actors entering into the assemblage and from previously under-tapped capacities within both component parts and wholes (Bennett, 2010; Connolly, 2005).

Third, and following these two orientations, assemblage thinking refutes the reduction of causality to the binary poles of disorder and randomness on the one hand and cause-and-effect on the other. Instead it is concerned with how specific agential intra-actions articulate assemblages. Rather than attributing causality to humans and nonhumans, assemblage focuses on how causality emerges through the non-deterministic enactment of practices of world-making.

For instance, Li (2007: 285) draws upon Deleuze and Guattari's reading of diffused agency in which material content (e.g. bodies, actions, and passions) and enunciations (e.g. statements, plans and laws) are linked not in a linear fashion but rhizomatically as reciprocal presuppositions and mutual connections play themselves out in the constitution of a social field that is always being provisionally ordered: "I emphasize agency – the work that situated individuals do – without re-inscribing the self-sovereign subject with a master-mind, a master-plan or a singular interest and intention" (*ibid*: 286).

Of course, rethinking notions of causality is not new within Geography. For instance, there is a connection here with David Harvey's conception of dialectics, if not with the conception of dialectics Deleuze and Guattari seek to dispense with in *A Thousand Plateaus*. As Harvey (2009) has argued, dialectics can be seen as a form of thinking through "coevolving ecological moments within what Lefebvre would call an 'ensemble' or Deleuze an 'assemblage' of interactive processes" (244). For Harvey, assemblage resonates with Marx's 'method of moments' – where 'moment' equates to a particular coming together of multiple agents – an interplay of socio-ecological processes of place-formation. The dialectical approach developed by Harvey requires not reducing any particular moment "to a simple refraction of the others". He suggests that "there is no automatic response that sets a predictable (let alone deterministic) pattern of interaction between the moments...the evolution is contingent and not determined in advance" (*ibid*. 243, 244). However, while Harvey refutes a

deterministic conception of place, we would argue that assemblage thinking extends this by attending more explicitly to non-linear forms of causality which, in turn, allows for a detailed account of how orders endure and change

For example, William Connolly (2005) argues for a conception not of 'efficient causality' but of *immanent causality*. Connolly's concern here is with how new and unpredictable directions develop when assemblages encounter novel perturbations. This means there is always an uncertainty to the agency of assemblages, a potential for relations to be otherwise. This is a conception of causality that seeks to depart from linearity and to make room for novelty and randomness in emergence. Here, randomness – whether in nature, computer programs, films, or modes of thinking - may emerge from multiple sources, such as the volatility of initial conditions, unexpected changes in external environments, or the chance relations that emerge as differential properties of existing parts are brought into the assemblage. The focus on immanence and nonlinearity rather than efficient or mechanical linearity underlines the work of assemblage as more than a theoretical tool, but as an ethos for thinking the nature of formation if we begin from the ontological diversity of parts. For example, Bennett (2010) describes research on the impact of omega-3 fatty acids on different people, from prisoners supposedly made less likely to commit acts of violence to school children apparently more like to learn effectively and bipolar sufferers seemingly less depressed. In contrast to a 'mechanical causality', this multiplicity more likely reveals an 'emergent causality' whereby

particular fats operate in different ways within different bodies, sometimes producing unpredictable effects: "This is because a small change in the eater-eaten complex may issue in a significant disruption of its patterns or function. The assemblage in which persons and fats are participants is perhaps better figured as a nonlinear system" (Bennett, 2010: 41-42). In a nonlinear system, small disturbances can have massive effects, meaning that the agency of small components is often only revealed retrospectively in specific traces or as the assemblage is later stabilised, and indeed may remain hidden altogether. Bennett uses Deleuze and Guattari's (1988) notion of the 'operator' or 'assemblage convertor' here to highlight the catalytic impact of well-placed elements in either transforming assemblages or ensuring relations and parts remain stable.

In addition, as DeLanda (2006) shows, new actors that enter into the assemblage may only effect *particular* elements of the assemblage, or may affect different elements at different points in time and in specific ways. For DeLanda (2006: 20) catalysis disrupts linear causality and its premise that the same cause *always* equals the same effect by showing that different causes can lead to 'one and the same effect' and that "one and the same causes can produce very different effects depending on the part of the whole it acts upon". DeLanda (2006: 21) uses the claim "Smoking cigarettes causes lung cancer" to exemplify his point: not everyone who smokes cigarettes develops lung cancer, and not all victims of lung cancer victims smoked cigarettes at some point in their life. Therefore, the cigarettes must be seen as catalysts for cancer (see also Harman,

2008). Hormones, to take a different example, may stimulate growth when applied to the tip of a plant but inhibit growth when applied to the roots (DeLanda, 2006: 20). The creative reworking of relations in motion may render causality multiple and indeterminate, meaning that the identification of mechanical causality results from 'cuts' to the assemblage that reveal only specific interactions: causality become visible in shifts between moments of unchartered turbulence and the congealment of agencies that appear as traces.

Assemblage and the stability of form

Rethinking causality and agency relates directly to a paradox at the heart of relational thinking: between accounts that emphasise the stability of assembled orders and those that emphasise dynamic change. Thinking with assemblage enables both sides of this paradox to be held concurrently. As we introduced earlier, rather than rely on forms of micro-reductionism – which posit dynamic change solely in the agential potential of capable agents – or macro-reductionism – which tend to figure stability and transformation as a product of broader 'social forces' – assemblage theory emphasises both the emergent nature of composition and the relative autonomy of an assemblage's component parts. It therefore offers a novel response to the enduring problem of how to think through processes of change and dynamism within relational thinking. In this section, we suggest that working with assemblage might be characterised by the

emphasis it places on an assemblage's 'expressive potential' (Deleuze and Guattari, 1988) whilst also accounting for the relative stability of (some) assembled orders.

As we have outlined above, assemblage theory is attentive to the practices and processes of formation that enable the composition of assembled orders whilst maintaining a sensitivity to the diversity of assemblage forms; a tree assemblage, a school assemblage, a genetic assemblage etc. Assemblage theory might therefore be read as a way of navigating two major theoretical issues concerning the stability of form and the processes of assemblage formation. On the one hand, assemblage thinking is inspired by an implicit critique of (neo)functionalism, evident in a range of contemporary social theoretical positions, of both structuralist and poststructuralist persuasion (Alexander, 1998). As we have outlined above, assemblage thinking insists on the exteriority of relations, standing against a conception of mute functionality of parts, as determined by their functional position in a greater organic wholes. On the other hand, assemblage theory might be read as an attempt to think variation in form without relying on a conception of essential difference. Here assemblage theory maintains an account of the differences between, for example a tree-assemblage and a school assemblage, without an account that relies on an essential tree-ness or school-ness as the mark of distinction. Rather in assemblage thinking difference is produced precisely by the autonomous capacities – rather than properties – of an assemblage's component parts coupled with the doctrine of

'emergent causality' we highlighted above. Rather than produce an essentialist account of the internal characteristics or make-up of this or that assemblage, assemblage thinking insists that that range of causal factors might have produced similar emergent forms, and in different conditions the same constituent parts might have produced different assemblages.

As we have suggested throughout this paper assemblage thinking might be understood as a properly post-relational ontology, particularly in its insistence on the autonomy of parts and the exteriority of relations. At its most vague relational theories have tended to invoke a conception of universal potentiality, as a way of accounting for both stability in form and the potential for dynamic change. Actor network theorisation have adopted a more detailed and subtle conceptual vocabulary for this problematic, emphasising the kinds of work required to maintain the stability of network relations (Law and Callon, 1992) and an account of the performative potential for such work to exceed their relational framing, producing overflows and externalities (Strathern, 2002). Assemblage theory takes an alternative approach to resolving this problem; one that is particularly adverse to notions of universal potentiality. This solution is, at the very least, radically particularist, attending to the singularity of compositions that are formed through the particular, but non-essential, capacities of component parts.

The particularist orientation of assemblage thinking is most obvious in DeLanda's (2006; 2011) recent development of an 'assemblage theory'. DeLanda's

ontology is characterised by a sustained discussion of the nature of form and form giving, the stability and durability of assemblages and what he terms the 'space of possibility', which concerns the relative tendencies of assemblages for spatial and temporal variation. For DeLanda assemblages are real and historic entities and individual assemblages are distinct from each other. The solution that he provides to the problem of the stability of assembled forms; one that insists on the singularity of assemblages, that assemblages are more than simply aggregates of their component parts, without implying a sense of essential characteristics or ontic fixity, is indicative of a emergence post-relational ontology evident in contemporary social theory more broadly (Bryant, et al., 2011).

Working with notions of emergent causality and a concept of agency located in the interactive processes of composition DeLanda characterises assemblages in three principle ways. Primary for DeLanda is their reality; assemblages are real entities in a world comprised of other real entities. By real, DeLanda also means that assemblages are geographically and historically contingent. An assemblage "is not defined by essential traits but rather by the morphogenetic process that gave rise to it" (DeLanda, 2002: 10). Assemblages are historic productions, but this history does not function in a determinative fashion. Rather assemblages are "born at a particular time, live a life, and then die. It follows that knowledge of an assemblage does not derive from a "botanical" classification that takes properties for granted but from an account of

the origin and endurance of those properties. … Every actual assemblage is an *individual singularity*" (DeLanda, 2011: 185).

This historic singularity is suggestive of the second characteristic of assemblages in DeLanda's ontology; that their identity is formed through the autonomous capacities of their component parts. As we introduced above, DeLanda makes a primary distinction between the properties and capacities of these parts. This distinction enables DeLanda to insist that assemblages are at once real, stabilised, and historic entities, whilst at the same time attending to the implicit tendencies of assembled orders for internal variation, change and dynamism. DeLanda's insistence on a notion of morphogenesis as the historic process that provides an emergent form to assemblages "gets rid of all *transcendent* factors using exclusively form-generating resources which are *immanent* to the material world" (2002: 10). The form of assemblages is not determined by some external social, biological or physical force, but is rather contingently determined by the capacities of the parts that make up an assemblage. By explicitly avoiding a notion of co-functionality – that parts are simply defined by their position and role in forming a great whole – the form of assemblages is therefore both immanent to this historic process and contingent upon its persistence and endurance. As such, "one and the same assemblage can have components working to stabilize its identity as well as components forcing it to change or even transforming it into a different assemblage. In fact one and

the same component may participate in both processes by exercising different sets of capacities" (2006: 12).

Based on this distinction DeLanda outlines a third characteristic feature of assemblages; that the stability of assemblages is neither absolute nor pure potentiality. Rather for DeLanda the form of assemblages subsist as a "structure of a possibility space", a figure that expresses the multitude of possible, though not necessarily actualised, capacities of an assemblage's component parts. Summarising his ontology DeLanda defines assemblages in the following way:

> Every assemblage must be treated as a unique historical entity characterised by a set of actual properties (making it an individual singularity) as well as by the structure of possibility spaces defining its tendencies and capacities (a structure defined by universal singularities). (2011: 188).

Whilst DeLanda's strictly realist image of assemblages is not shared by all proponents of assemblage thinking, his methodology for resolving the paradox, inherent in relational thinking, between stability of form and dynamic change is indicative of a wider orientation evident in assemblage thinking. Given his understanding of assemblages as historic and contingent singularities, DeLanda suggests that characterising the space of possibility is purely an empirical matter. Though it would never be possible to fully characterise the multitude of possible

capacities inherent in the formation of assemblages, DeLanda suggests that "some possibility spaces are continuous having a well-defined spatial structure that can be investigated mathematically" while others are "discrete, possessing no inherent spatial order but being nevertheless capable of being studied though the imposition of a certain arrangement" (2011: 5). So whilst assemblages are internally dynamic, a dynamism produced by the emergent capacities of an assemblage's component parts, DeLanda does not invoke a universal rule of dynamic change and strictly avoids an account of such possibility as subsisting solely as potentiality. Rather rates of change and relative degrees of stability are an empirical matter, dependent on the singularity of such capacities.

DeLanda's solution to the problematic of stability in form is heavily indebted to Deleuze and Guattari's own characterisation of assemblage. Though posed in different terms, Deleuze and Guattari's conception of assemblage, is marked by a similar conceptual move to DeLanda. In developing a concept of assemblage Deleuze and Guattari's strive to avoid a universal model of dynamic change and equally steer clear of a vague model of universal potentiality. Their conception of assemblage is characterised instead by a notion of expression, which parallels DeLanda's notion of capacity. For example, they suggest:

Assemblages are defined simultaneously by *matters of expression* that take on consistency independently from the form substance-relation; reverse causalities or 'advanced' determinisms, decoded innate

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functions related to *acts of discernment* or election rather than linked to reactions; and *molecular combinations* that proceed by nonconvalent bonding rather than by linear relations.

(Deleuze and Guattari, 1988: 337)

Deleuze and Guattari's notion of expression is therefore a critique of two major currents in contemporary theories of representation and communication; theories of representation where expression is defined by its content and where 'content is viewed as having an objective existence prior and exterior to the form of its expression' (Massumi, 2002a: xiv) and the alternative premise that content is defined by form, where communicative expression is a manifestation of extra-linguistic social forms. Though Deleuze and Guattari see that expression is external to language, this exteriority is not simply a matter of unseen social factors. Rather the exteriority of relations between expression and the content of expressions is maintained by the performative quality of expression itself, whereby "every utterance is an "order-word" in the sense that it moulds, subtly or directly, the potential actions of its addressees" (Massumi, 2002a: viii).

In order to illustrate this point Deleuze and Guattari (1988) gloss Foucault's (1975) well-know analysis of the prison. They suggest that Foucault's discursive analysis points to the proliferation of the 'prison-form', which is reciprocally tied to 'delinquency' as a form of expression, "a new way of classifying, stating, translating, and even committing criminal acts" (Deleuze and

Guttari, 1988: 66). Here we have an example of how different agents act through particular interactions, and how the assemblages that surround punishment come to be defined by particular expressions of power. Though the prison-form appears as a complex assemblage of power the expression of delinquency "has an autonomous content all of its own" (*ibid*. 67). In DeLanda's terms delinquency might be read as a capacity and as such the prison-form has a contingent and expressive tendency to transform into and merge with other social institutions – the school, the clinic and the factory (see also Massumi, 2002a). In different historical circumstances the prison form, and most particularly delinquency, has a morphogenetic capacity to be joined up with other social and political dynamics to form different and alterative assemblages. It is in this sense that the notion of assemblage for Deleuze and Guattari implies a conception of the expressive capacity of assembled orders as an index of their durability, stability and capacity for morphological change.

Conclusion

In geography, we have witnessed not so much a 'relational turn' as a mainstreaming of relationality as a point of departure for geographical research and debate (e.g. see, to highlight just a few instances, the different interventions of and debates around Jessop, Brenner and Jones, 2008; Massey, 2005; Marsten, Jones and Woodward, 2007). The proliferation of the notion of assemblage

emerges in this broader context. Its promise lies in attending to how entities that differ in nature and kind from one another intra-act through relations of exteriority. As such, assemblage theory demarks a key difference to the broader - and vaguer - claims that finite, contingent, entities are 'relationally constituted'. We have argued that assemblage thinking offers four things to contemporary social-spatial theory; an experimental realism orientated to processes of composition; a theorisation of world of relations *and* that which exceeds a present set of relations which involves focusing on the capacities of both interactions *and* component parts; a rethinking of agency in distributed terms and causality in non-linear, immanent, terms; and an orientation to the expressive capacity of assembled orders as a way of describing how they remain stable and change.

In closing, we want to consider some of the potential questions for ethics and politics that follow from this characterisation of assemblage thinking.

First, the realism of assemblage theory has implications for questions of responsibility and ethics, where the starting point is to disrupt a metaphysics of the individual as foundational to ethics. Reading causality as an emergent property of intra-action shifts questions of responsibility from a position of exteriority to the world to a context of radical reciprocity. What Barad (2007: 392, 296) calls an 'ethics of worlding' opens multiple spacetimes of intervention within assemblages, where the imperative to act responsibly is one of "meeting each moment, being alive to the possibilities of becoming', an 'ethical call, an invitation that is written into the very matter of being and becoming". Or, as

Bennett (2010: 37) puts it: "Perhaps the ethical responsibility of an individual human now resides in one's response to the assemblages in which one finds oneself participating". The difficulty here lies in a potential tension between a materialist ontology that emphasizes the distribution of agency and responsibility, and a tendency to centre the human, or groups of humans, as the basis or arbiter of causation and responsibility and therefore the referent object of ethical judgement. This tension is in part a product of our methodological choices – in centering out research objectives around particular actors, we are already producing a particular kind of agency while marginalising others. But there is more to this. We may, for example, choose to act strategically in our decision to attribute responsibility as part of a politics of critique. This entails purposively enacting what Barad calls 'agentic cuts' within assemblages. For example, Bennett (2010: 38) contends: "It is ultimately a matter of political judgment what is more needed today: should we acknowledge the distributed quality of agency in order to address the power of human-nonhuman assemblages and to resist a politics of blame? Or should we persist with a strategic understatement of material agency in the hope of enhancing the accountability of specific humans?" Perhaps Bennett oversimplifies the choices here, but what she usefully adds is the possibility that our ethical or political obligations might demand that we cut and specify causality within assemblages in order to attribute responsibility and blame. In other words, we might

strategically choose who or what to hold to account as an ethical or political stance.

Following on, the second issue is one that is only just being examined through assemblage in geography, and pertains to assemblage's politics. In raising this we are not suggesting that assemblage has or should have any particular politics. Instead we want to consider what ramifications there might be for thinking politically when we start with an understanding of the social that is figured in the terms of assemblage. In common with other forms of relational thought, the politics of assemblage begins from a claim that orders are contingent achievements that require ongoing work. At its most simple a politics of assemblage maps how powerful assemblages form and endure, thus loosening the deadening grip abstract categories hold over our sense of political possibility. But can this now fairly well known starting point be translated into a positive decree? Certainly, assemblage has a differential political history in this respect, whether in the shape of the compositionalism of the autonomist Marxists (Berardi, 2008), in Hardt and Negri's (2004) conception of the 'multitude' and their more open-ended and explicitly biopolitical rendering of the 'commons' and 'revolutionary assemblages' in *Commonwealth* (2009; and see Negri, 2006), or indeed in what Tampio (2009) calls, after Deleuze, 'left assemblages' and what Ruddick (2010) calls 'emancipatory assemblages'. There are, of course, differences in how assemblage thinking emerges here, but in each case assemblage names an orientation to the possibility of politics. For Hardt and

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Negri (2004), the multitude emerges broadly through a proletarian revolution acting as a Leninist agent, while in *Commonwealth* (2009) their focus is more on possibility of building *institutions* that harness the horizontal and affective life of capitalist biopower in the assembling of multiple voices, knowledge and modes of living. 'Left assemblages' extends this latter conception by focussing on the experimentation with difference as a means for *actualising* ideals like freedom and equality (Tampio, 2009). In these different accounts, assemblage operates as a potential for political unity through difference, where the agents that produce that unity have long been the subject of controversy on the left, from the agent of working class consciousness to the post-capitalist rendering of infinite multiplicity. For us, the key questions would be: How does assemblage thinking denote the possible in politics? What kinds of politics might that privilege and exclude? And how to these positive experiments in the politics of assemblage relate back to forms of empiricism that reveal the contingency of arrangements?

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