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On pragmatism, assemblage and ANT: assembling reason

Gary Bridge

Abstract

In geography the key theoretical registers of assemblage theory and Actor Network Theory have been psychoanalytic-semiotic, materialist and vitalist (emphasising affect). In contrast, this paper indicates the original influence and continued relevance of philosophical pragmatism's action-oriented approach for assemblage and ANT. It suggests how a pragmatist understanding of human experience, situation and reason offers a different perspective on the nature of emergent and relational space in assemblages and networks. This perspective extends existing pragmatist work in geography to explore the distinctive, hyper-relational spatialities of human activity in a world of acting things, suggesting wider implications for progress in human geography.

Introduction

Assemblage theory has been taken up extensively in geography (Muller & Schurr 2016; Anderson et al 2012; Muller 2015; Smith 2017; Dewsbury 2011; McFarlane 2011ab; Farias 2011; Farias and Bender 2010; Kamalipour & Peimani 2015). It is part of a wider intellectual movement that is anti-foundationalist, emphasising process, emergence and immanence (DaLanda 2016). Alongside this has been the growing influence of vitalism: the idea that organisms have a life force beyond their physical-chemical compositions. Also implicated is the extension of vitalism into materialism as new materialism, in which objects, materials, substances can also be considered to possess vital forces of various kinds rather than being inert, unchanging 'stuff' (Bennett 2010; Latham & McCormack 2004). The idea of vital environments in which non-human elements act in certain ways can be seen as a re-articulation of long-standing environmental sensibilities in geography, as well as development of ideas on relational and non-representational space (Allen 2016; Thrift 2007). Assemblage theory also connects to Actor Network Theory (although the closeness of this relationship is disputed - Anderson et al 2012; Muller and Schurr 2016) and the idea of effects in human/non-human networks of actants (Latour 2007). Going on alongside these developments are post-Cartesian critiques of the sovereignty of human reason, along with the decentring of human action and rationality from its former dominance in understanding action and effects. Action is distributed away from human subjects and their reflexivity and into networks of actants or assemblages, in which the driving force is affect in the form of distributed desire (or 'will'). Affect may emanate from human bodies but is more a product of the co-constitutive properties of the emerging assemblage itself.

The material and psychoanalytical aspects (objects and affects) of assemblage theory and ANT are the ones that have been most developed in geography (Anderson et al 2012; Muller and Schurr 2016; McGuirk et al 2016; Prince 2016) owing more to poststructuralist and psychoanalytic approaches of continental philosophy than to pragmatism. Yet philosophical pragmatism had a direct influence on the original development of ANT and of assemblage theory. What I suggest in this paper is that these pragmatist strains have a special significance in progressing assemblage and ANT work in geography, and at the same time have wider implications for ongoing research beyond assemblage and ANT in human geography as a whole.

Pragmatism in geography

A call for the development of pragmatist thinking is not alien to geography. There has been a growing amount of attention paid to pragmatism in geographical scholarship. The dominance of analytical philosophy and of Marxism in geography meant the earlier influences from Chicago School sociology in the 1920s and 1930s were eclipsed for most of the 20th century, with pragmatism being revived with developments in the 1970s and 80s humanistic geography and the exploration of human experience and intentionality (Ley and Samuels 1978; Jackson and Smith 1984 – see Barnes 2008). Jackson and Smith (1984) looked at how pragmatism informed the ethnographic work of the Chicago School in taking social context and situated knowledge seriously. These departures influenced subsequent developments in social and cultural geography, especially in identifying more situated relationships between knowledge, practice and action and over methodological concerns in forms of critical ethnography as method in cultural geography (Cloke et al. 2004, Anderson 2009).

Over recent years there has been a more direct and sustained engagement with pragmatism in geography. A themed issue on pragmatism and geography in *Geoforum* in 2008 identified how pragmatism's anti-foundational, anti-dualistic thinking and its recognition of the situatedness and contingency of knowledge acquired through action particularly resonates with prevailing concerns in geography. It emphasised the significance of context and contingency in economic geography (Barnes 2008); of democratic action in urban space (Bridge 2008, 2005); and the significance of neo-pragmatists, such as Bernstein (1991, 2010), Shusterman (2000) and Rorty (1982), in connecting pragmatism with continental philosophy to provide a renewed geographical epistemology and methodology (Hepple 2008). Furthermore, the significance of pragmatism for understanding space was explored: in how it provides a relational understanding of space and place (Cutchin 2008) and indeed (in terms of the focus of this paper), with pragmatism, non-representational theory, assemblages and actor networks (Jones 2008). Allen (2008, 2016) took topological idea of space developed by geographers and inflected it through pragmatism into an idea of power as contingent, situational and a shared experience. Conversely, he showed how the topological view is reflected back onto pragmatism to enhance its processual and relational idea of action. Engagements with pragmatism in geography have continued on a number of fronts: on space and radical democracy (Barnett and Bridge 2013) and pluralist critique (Barnett and Bridge 2017) on process pragmatism as a guide in 'engaged' geographical research (Harney et al 2016); on 'discursive' economic and political institutions (Fuller 2016); on human habits and the environment (Dewsbury 2011, 2015; Schwanen et al 2012; Pedwell 2016; Bridge 2019).

These contributions run alongside the growth of pragmatist thought in other social sciences such as sociology (Baert 2005), in urban studies and planning (Hoch 2019, Lake 2017, Healey 2009) and in environmental studies (Light & Katz 1996; Weston 1985; Norton 1984; Minteer 2012).

Whereas the presence of pragmatist thought has been felt across a range of themes in human geography I believe some of the implications of this thought could be pressed much further. Indeed, the nature of geography as a discipline, with its focus on organism-environment relations, is ideally suited to this development. In this paper I want to illustrate this using the examples of assemblage theory and Actor Network Theory. I explore the pragmatist influences on assemblage and actor network theories and go on to argue how acknowledging the full implications of those influences starts to reshape these theories, and in particular their spatialities. I suggest that it points to a radically contingent and empirical (rather than transcendental) form of hyper-relational space, but one that situates (in a profound sense of that word) human experience and human reason, even allowing for human experience being relativized as just one component of the assembly/network within those spatial networks and assemblages. The differences a thoroughgoing pragmatist reading makes to assemblage theory and ANT reflects, I argue, broader implications for progressing human geography more generally. First, though, I explore some of the philosophical resources that pragmatism offers by focusing on one particular pragmatist philosopher, John Dewey, and his conception of human-environment relations through his ideas of transaction, experience, situation and inquiry and how these relate to assemblage theory and ANT.

Transactions, experience and situations in assemblages and Actor Networks

John Dewey (1859-1952) absorbed deeply the implications of Darwin's theory of evolution in his social philosophy. Darwinian naturalism reveals the contingency of human organic existence (in the arc of evolution) and the vulnerability of human activity and fallibility of human knowledge in negotiating a world "with a sense of dependence upon forces that go their own way without our wish or plan" (Dewey 1983: 200). It also reveals how human organisms are vulnerable to those wider forces because they are imbricated in them. Dewey's idea of transaction captures the co-constitutive relationship between objects and organisms, indeed the term transaction is a revision of his earlier term interaction (Dewey and Bentley 1949). Interaction, Dewey felt, might imply that the relationship was between finalised or complete objects and organisms. Transaction was a better term to convey the fact that the relationship was co-constitutive, in which both elements had effects, including objects 'calling out' or objecting to responses in human organisms: Dewey refers to "affectual and volitional objects" (1981: 30). Transactions involve a degree of co-constitution such that human organisms' responses to a stimulus, such as an object, are not to the stimulus but *into* it (Dewey 1896). No objects or subjects are finalised or rounded-out: they are contingent, and unfinished. Transactions are processual - and all phenomena (organisms and objects) are sequences of events: "every existence is an event" (63)[1].

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[1] Bignall (2015) explores the convergence of Dewey and Deleuze in their event-based philosophies.

Assemblage theory and ANT's concern with emergence and with how objects and organisms are co-related was thus at the core of Dewey's philosophy (involving a rejection of the subject-object dualism). Process, event, contingency, heterogeneity, connections and relations are all features shared with assemblage thinking (Anderson et al 2012).

For Dewey, those complexes of transactions in which organisms are a part comprise experience. Experience is objective (rather than subjective) in the sense that it is comprised of transactions that are material-organic relations.

> Experience is *of* as well as *in* nature. It is not experience that is experienced but nature- stones, plants animals, health temperature, electricity and so on. Things interacting in certain ways *are* experience: they are what is experienced. Linked in certain other ways with another natural object – the human organism – they are *how* things are experienced as well. Experience reaches down into nature; it has depth. It also has breadth and to an infinitely elastic extent. It stretches. (Dewey 1981: 12-13, emphasis in original)

Experience is the objective outcome of complexes of transactions. It is objective in that it can be comprised wholly of objects and organisms and the certain ways they interact. Those transactions involving humans constitute a form of experience in a continuum (from embodied through to reflective): *how* things are experienced. Complexes of transactions involving human organisms are also objective in that they are in part comprised of objects and their effects as well as having objective force in the world (rather than experience being about individual subjective states). Experience is what James called, and Dewey endorsed, the process of experiencing as well as accumulated experience:

> [experience] is 'double-barrelled' in that it recognizes in its primary integrity no division between act and material, subject and object, but contains them both in an unanalyzed totality. 'Thing' and 'thought' . . . are single-barrelled; they refer to products discriminated by reflection out of primary experience. (Dewey 1981: 18-19)

Experience is largely not about knowledge (or at least 'known' knowledge) but of non-cognitive engagement with a world that is undergone: suffered and enjoyed ('had' knowledge). It is connective and networked, rather than being particularistic. It is a prospective objective force in the world, always moving forward "all living is a going-*on*, and futurity colours the qualities of any situation into which organic factors enter as components" (Dewey 2012, 340 emphasis in original). From this perspective human experience consists of a series of overlapping and interpenetrating transactions (Muhit 2013) in what Dewey called 'situations'.

> 'Situation' stands for something inclusive of a large number of diverse elements existing across wide areas of space and long periods of time, but which, nevertheless, have their own unity". (1989: 281)

Situations' reflect the complexity of relations between material and organic components (Dewey 1984; 1986; 2012). There are 'extensive and enduring' situations of what Dewey calls 'togetherness':

Because everything experienced is determined by interactivity of organic-ongoing conditions, everything inquired into and discussed belongs to a field or situation. Fields and/or situations possess spatial and temporal togetherness of the existences and events that constitute them. They are extensive and enduring. 'Togetherness' as used here covers what is often named by the words connections and relations, and interconnections and relationships. I have employed a word derived from the word together because I want to avoid as far as possible prejudgment regarding the kind of way or ways in which things go and come together in forming situations. (Dewey 2012, 334-5)

There is a strong note of naturalism here, in the sense of Dewey not wanting to prejudge "the way or ways in which things go and come together". He is not assuming that human activity brings situations into being nor even that interconnections are primarily organic. Indeed, elsewhere he argues, "the action called organic is not just that of internal structures: it is an integration of organic-environmental connections" (Dewey 1981: 213). Equally, using the term 'things' is neutral with respect to the components that make up the situation. Again, there are parallels with assemblage and ANT here, in the sense that there is no strong ontological privileging of the human elements of the network or assembly in understanding its formation or coherence. However:

The more complex is an organism the greater the variety of activities in which it engages and the more intricately are its diverse actions bound up with one another. Its environment is correspondingly spread out in time and place and contains a similar variety of factors which sooner or later have to be dealt with. (2012, 327).

Extensive and enduring situations can be seen as networks, assemblages or fields through which human organisms meet the challenges of the environment. They are dispersed fields of dispositions of problem-responsiveness (involving organisms and objects). Relations in networks can become unstable and unpredictable in which case the more immediate situation becomes doubtful or disturbed. This is a "problematic situation" (Dewey 1986) in which activities of inquiry and problem-solving are thus brought to the fore. These activities are practical and comprised by the socio-material contexts in which they operate as forms of controlled inquiry, or practical reason.

Practical reasoning in assemblages and networks

Practical (as opposed to theoretical) reasoning involves the co-implication of organisms and objects. This is evident in the sequence of action that Dewey identifies as enquiry (Dewey 1986). The antecedent conditions of enquiry are themselves material and 'objectful': "the biological antecedent conditions of an unsettled situation are involved in that state of imbalance in organic-environmental interactions …" (1986: 110). Thus "the indeterminate situation comes into existence through existential causes" (111). Indeterminate situations are first felt, rather than thought. Affect itself is situational as it pervades the unique combination of materials and organisms that comprise the situation: "*We* are doubtful because the situation is inherently doubtful" (109, emphasis in original). There are parallels here again between assemblage and

situation in that both acknowledge that affect is non-individual and is distributed through the assemblage (Deleuze) or the situation (Dewey).

The early phases of action in problematic (uncertain, uncanny) situations draw on affect and the dispositional resources of the body (habits). Existing habits are the first resource to resolve encountered problems. They are in the form of 'had' (rather than 'known') knowledge or embodied intelligence. Initial interventions are mostly physical and phenomenal: to re-arrange the existences of the situation. As Dewey has it "… restoration of integration can be effected, in one case as in the other, only by operations which actually modify existing conditions, not by merely 'mental' processes" (Dewey 1986: 110) and further " … resolution of the indeterminate situation is active and operational" (111). Furthermore, habits are not confined to individual bodies but are shared dispositions. These dispositions are loaded with material and non-organic relations, "functions and habits are ways of using and incorporating the environment *in which the latter has its say as surely as the former*" (Dewey 1983: 15, my emphasis). Habits are not purely social or cultural but contain structures of the environment: they are material and 'objective' in that sense. In assemblage/ANT terms they are one aspect of a live environment that 'lives' through embodied habits.

If habitual responses are unsuccessful the problematic situation is pushed into more reflexive responses from humans and engage reflexive problem solving (the mentalistic phase of action called 'thought'). In ongoing transactions objects become events that are filled with meanings that depend on the context of the problematic situation: in how they problematize the situation for human organisms; in the way that they 'object' or oppose or in what they 'call out' from humans. Nonhuman entities may present 'propositions' (Latour 2004). A persistent problematic situation pushes the response into the mentalistic phase of action involving trial and error and experimentation in a form of controlled inquiry. This is a sequence of coordinated action and experimentation, not individualised reflection. What Dewey calls 'the institution of the problem' and the 'problem-solution' (1986) are determined by context. The particular combination of elements in the 'problematic situation' helps frame thinking.

There are several aspects of the Deweyan idea of 'thinking' to consider here. First, reflective consciousness is a relatively specialised and restricted aspect of nature. The conditions that allow consciousness to exist have been limited over the sweep of evolutionary history. Furthermore, a good deal of what constitutes organic activity (including the activities of human organisms) is non-conscious. Ongoing activity, including responses to novel or problematic situations, involves psycho-physical responses that never reach the phase of action we might call conscious, let alone reflexive consciousness, or rational thought. Secondly, when 'thought' does occur it is not an individualised cognitive activity but rather 'mind' is socially shared and communicative, involving cooperation and conflict. Thirdly, thought is a later phase of action imbricated in practical activity, rather than being abstract pure cogitation. Thought is engaged to try to make an uncertain problematic situation clearer, less threatening, more stable, in order for activity to continue (Dewey 1986). Contestation and conflict are inherent in problematic situations, which are in part an objection by the environment, the objecting qualities of objects, inducing a clash of habits and, if it gets that far, competing arguments and justifications for ongoing action.

Pragmatism here is displacing and dispersing 'thought' into the networks of activity in which it is seen as being embedded. It is also emphasising the significance of embodied dispositions in ongoing human activity. This parallels the significance given to bodies and affect in assemblage theory (Thrift 2007). At the same time, rather than displacing and dichotomising thought away from affect and embodiment (to privilege the former) a pragmatist approach sees these qualities as different phases of action of which temporality and, I argue, spatiality are defining qualities.

The spatialities of practical reason

From this pragmatist perspective rational inquiry is not abstract reflection on an objective world but rather experimental intervention in the conditions of the world in the process of 'clarifying' or (temporarily) settling them. To the temporality of reason and its implication in unique situations I would add spatiality as part of this phenomenal intervention of reasoning. One is ratiocination which, rather than the calculation of equivalence or proportion in traditional ideas of rationality, is action in coordinating the situation. This involves the spatialised attributes of organic elements. As Dewey argues:

> In contrast with lower organisms, the more complex forms have distance receptors … what is done is response to things nearby is so tied to what is done in response to what is far away, that a higher organism acts with reference to a spread out environment *as a single situation* (…) an organism acts with reference to a time spread, a serial order of events, as unit, just as it does in reference to a unified spatial variety. Thus an environment both extensive and enduring is immediately implicated in present behaviour. (1981: 213, my emphasis).

This integrative capacity of higher organisms is especially marked in humans. Writing a century before assemblage theory Dewey argues that:

> Everything that exists in as far as it is known and knowable is in interaction with other things … There is … nothing new or unprecedented in the fact that assemblage of things confers upon the assembly and its constituents, new properties by means of unlocking energies hitherto pent in. The significant consideration is that assemblage of human beings transfers sequence and co-existence into participation. (Dewey 1981: 138)

Participation is an outcome of the more extensive and enduring situations of problem-responsiveness[2]. It involves habits that incorporate the structures of the environment. Further ramifying these pathways is the added mobility provided by the communicative action of human organisms. Performatives in speech and written language are both contextual (indexical) to specific situations, and mobile in that they set the potentialities of objects in motion. Thus, when shared through linguistic action, rather than relying on 'brute circumstance', "[the object] is an immediately recognised and possessed trait; the flower means portability instead of being simply

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[2] There are strong parallels here with Foucault's (1998) idea of extensive regimes of problematisation – see Koopman 2011; Barnett and Bridge 2017) and further argument later in the paper.

portable" (Dewey 1981, 142). But linguistic action, in pragmatist terms, is also a form of commitment; in the way that it binds participants in communication to certain forms of intelligibility and performative credibility that are the explicit outcomes of the sense-making implicit in semantic meanings. As Brandom (1998) conceives it, they are responsibilities in that they involve commitments and justifications that meet in the space of reasons (Sellers 2007). This has the effect of extending the actual and potential connections of problem responsiveness in ramifying ways:

> when experience does occur, no matter at what limited portion of time and space, it enters into possession of some portion of nature and in such a manner as to render other of its precincts accessible. (1981: 11-12)

Actor Network and assemblage theories pluralise what are conceived of as the active elements in networks of effect. The greater range of actants, and the role of objects as consummation of activity, pluralises the networks that are coordinated. Coordination is more complex, the issues emergent, and the environment more demanding of rationalities of coordination. In assemblage theory the transitional coherence of assemblages is a result of productions of desire (will) in collections of desiring machines. From a pragmatist perspective affect is distributed (situational) but that very distribution engages continua of activity, from affect, to embodied habit (as a distributed disposition) through to reflective thinking (as a form of experimental action) and back again.

The argument here is that reasoning is deeply implicated in contextual material-environment-organism transactions. The problematisations involved in reasoning do however start to discriminate the particular qualities of transactions. First, "[n]o inanimate thing reacts to things as problematic" (Dewey 1988: 179). The way that problematic situations feel (as situations, rather than individual 'feelings'), the way that problems are instituted (in part materially conditioned) is also a result of human capacities for communication. Humans problematise 'things' when things act in certain ways (obstructing, confounding, objecting). However, although nonhuman organisms and objects have these effects, they do not take the perspective of others into account when acting (Jarolmack and Tavory 2014, 69). In contrast, the social environment in which humans act is replete with mutual anticipations and perspectives. These have the effect of conditioning actions and binding in participants (even if in conflict). Human communication itself is a form of mutual perspective-taking and turn-taking as a form of performative action (as revealed in the pragmatics of communication, such as in Speech Act Theory - see Austin 1962).

This more distanciated, worldly view of human action and experience, involving affect intensities and more distributed 'thinking' shot through with environmental structures, has been greatly enriched and expanded by neopragmatist philosophers, especially Bernstein (2010), Shusterman (2000, 2012), Rorty (1982) and McDowell (1996). Richard Bernstein (1991, 2010) was instrumental in opening up the channels between pragmatism and continental philosophy, in emphasising their common anti-foundationalism, but in also recognising the contribution of continental philosophers to a deeper understanding and acknowledgement of humans as subject to wider, wordly forces. Two illustrations of this come from John McDowell's idea of the conceptual realm and Richard Shusterman on affect.

In *Mind and World* McDowell (1996) drew on Wittgenstein to argue that the conceptual realm is not confined within the cogitating mind but extensive and continuous with nature. This unbounded conceptual realm, he argues, gives humans access to knowledge of a reality independent of them but in a world that also imposes rational constraints on them (McDowell 1996, see also Bernstein 2010). In a similar vein, in terms of affect, Shusterman argues against the passive idea of the body in science and the discursively defined body of cultural studies, to argue for a focus on the body through pragmatist somaesthetics, in which soma is a "living, feeling, sentient, purposive body" (Shusterman 2008, xii). Soma is not confined to the body but is more extensive and transactional (in Dewey's terms) with the environment, involving habit which embed environmental structures (Dewey 1983, see Bridge 2019). Shusterman draws on Dewey's idea of 'body-mind' (Dewey 1981, 191-255) as a continuum rather than a dualism. The body exchanges energies with the environment "as much in process 'across' and 'through' skins as in process 'within skins' (Dewey and Bentley 1991, 119, see also Sullivan 2001 for a pragmatist feminist interpretation). In terms of the concerns of this paper, Malecki and Schleusener (2015) explore what they see as the strong synergies (and distinctions) between Shusterman and Deleuzian thinking in terms of 'affect politics' (see Massumi 2015).

Pragmatism, assemblage, ANT and geography

Before drawing out the implications of these pragmatist ideas of transaction, experience and situation for ideas of relational space in human geography, I look back at some of the original influences of pragmatism on assemblage theory and ANT to indicate how pushing these pragmatist principles further makes a difference to how these approaches are currently used in geography. It points to more radically empiricist understanding of the spatialities of assemblages and actor networks avoiding some of the more transcendental elements of assemblage theory in particular.

Pragmatism influenced ANT through Latour's interpretation of the classical pragmatist William James's idea of radical pluralism (James 2012 [1909] – see also Marres 2007, Latour 2008, Koszanowicz 2016; Hennion & Muecke 2016). James's pluralism ranged from metaphysics (an indeterminate pluriverse) through to forms of consciousness and experience across species (Goodman 2012) in networks involving objects "[as] plural and open, an expanding tissue of heterogeneous realities, but connected loosely, 'still in the process of making' as James nicely puts it" (Hennion & Muecke 2016, 302 see also Latour 2008). Elsewhere Marres (2007) uses Dewey's *The Public and its Problems* (1984) to establish the significance of an issue-based approach to the formation of publics in complex social and material entanglements (or Actor Networks) in what she calls the socio-ontological aspects of Dewey's philosophy; socio-ontological aspects which I explored further in the previous section of this paper.

In assemblage theory Deleuze's idea of exteriority of relations (Deleuze 1991; 2002) was again adapted from William James's work (1977) to suggest that the objects or components of an assemblage have an autonomy which enables them to have relations outside the assemblage. In geography Anderson et al (2012) interpret this in as things being conditioned, but not determined, by their relations, and relations having autonomy from the terms related (see also

Robbins and Marks 2010). This opposes an organic view of relations being solely composites of the organic whole (interiority of relations). The point of this is to suggest a looser set of relationships both in terms of constant emergence of relations as well as the contingencies and transitions that assemblage theory emphasises. It also suggests how parts of assemblages can be flipped and inserted into other assemblages without a reconfiguration of the whole. This translates into spatial formations which that can rapidly detach from certain contexts and recombine in others, such as for example, in Muller and Shurr's (2016) example of the global parental surrogacy industry. Medelrieux (2015), however, claims that Deleuze's interpretation of exteriority of relations owes more to Bertrand Russell's atomist ontology (that in turn supports Deleuze's idea of pluralism) than it does to James. Following James's rather than Russell, Medelrieux asserts, would have rendered relations of exteriority (or interiority) purely as an empirical question, rather than a transcendental and metaphysical claim that relations are necessarily exterior to their terms. Some assemblages may be more 'interiorised' in their relations than others. As we have seen from Dewey some 'problematic situations', for instance, are characterised by a togetherness of components in a qualitative whole. Terms related in these cases are related through human experience and inquiry.

A second implication of the radical empiricism of pragmatism relates Deleuze and Guattari's (1987) ideas of 'territorialisation' and 'de-territorialisation' (stabilisations/de-stabilisations of the assemblage). Bowden, Bignall and Patton (2015) explore how Deleuze and Guattari replaced classical pragmatist Charles Sanders Peirce's (1992; 1998) semiotics and signifier-signified relations with territoriality and de-territorialisation. Rejecting what they saw as the restrictions of linguistic presuppositions in Peirce's work they wanted to experiment beyond established strata of signification (of which the attempt to analyse normalises dominant relations). They also saw how minor interpretations can de-territorialise signs and can re-assemble in new territorialisations.

> According to Deleuze and Guattari, this complex process of semiotic release and capture – of critical de-territorialisation and creative re-territorialisation- is the proper aim of pragmatic thought: "Experiment," they urge, 'don't signify and interpret [Deleuze and Guattari] (1987, 141). (Bowden, Bignall and Patton, 2015, 7)

Ideas of territorialisation and de-territorialisation have been deployed in geography – including, for example, population geography (Duffy and Stojanovic 2018) and political geography (Dittmer 2013; Muller 2015). As well as being suggestive metaphors Deleuze and Guattari's ideas of territorialisation and deterritorialization as critique of linguistic presuppositions/semiotic systems resonate with the poststructuralist impulses of geography in conveying the co-emergence of spatial relationalilities and affectual/discursive formations. Again, though, as Patton (2016) argues, Deleuze and Guattari's interpretation of territorialisation and deterritorialization relies on a transcendental quality, that of the idea of 'absolute deterritorialization' (or evisceration of meaning) against which semantic formations are to be judged. Degrees of territorialisation or deterritorialization, from a pragmatist perspective, are again, wholly empirical questions, open to empirical comparison, rather than being judged against some transcendental yardstick.

Pragmatism gives a much more radically empirical reading of ideas of process, emergence, immanence and virtuality than those that have become more pervasive in geography. Emergence is central to Deweyan process philosophy (in common with assemblage thinking), showing qualities of immanence (Bignall 2015, Pappas 2008). Again though, pragmatism situates human experience in this emergent, immanent world. Deleuze and Guattari's idea of 'virtuality' (as the 'thingliness' of things - a tension between potential and realization) captures the immanent potentialities of assemblages, giving them overall coherence. Deleuze's philosophy of becoming is also about potential other states, part of the wider 20th century critique of the metaphysics of presence in which his works sits. Dewey too rejects the metaphysics of presence as part of his overall critique of philosophy's mistaken quest for certainty (Dewey 1988; Garrison 1999). His event-based processual philosophy is concerned with emergence, waxing and waning, beginnings and consummations, consummations that are in turn beginnings. The absence of essence, permanence and certainty points at the same time to possibility, contingency and potentiality. Events imply possible alternatives; presences suggest absences:

"The visible is set in the invisible; and in the end what is unseen decides what happens in the seen; the tangible rests precariously upon the untouched and ungrasped" (Dewey 1981: 44-45)

"… [we cannot render things] 'wholly present ... or so completely present as to exclude movement and change" (Dewey 1981, 384)

" … there are at a given time unactualised potentialities in an individual [object or organism] because and in as far as there are in existence other things with which it has not yet interacted" (Dewey 1991: 109).

For Deleuze this is not just limited to things in existence but to potentialities. This is true of Dewey too: virtuality is relations that have not (yet) been grasped. However, virtuality is at its height in the capacities of human organisms to ramify their connections, including to connections as yet ungrasped, but also to integrate them according to the exigencies of situations. This is especially emphatic when reflective intelligence is engaged, which for Dewey exists in large inclusive systems of connections (rather than individual cognition) involving "a social medium of symbol use and thought connected to distal environments at both ends" and involving actions and their consequences (Godfrey Smith 2002, pS29). Mind connects to the world via action, and new ideas, which change the possibilities of action, "[a]s ideas change there is a kind of action-at-a-distance change that is made to things being thought about" (2002, S29). The relations in which they sit are changed, and changed relations, Dewey believes, are just as significant as changes to the intrinsic properties of things. These changed relations have the potential for transformation, constrained by local powers of human action (Godfrey Smith 2002). Again, the emphasis here is on the nature of the empirics of changing relations rather than some more transcendental immanent force.

In assemblage theory the distributed and extensive systems that cohere the assemblage are not cognitive and reflective but subconscious and unconscious desire in affect and emotion (as a form of will). Rather than the interiorised, symbolic, domesticated (familial) idea of the power of the unconscious in traditional psychoanalysis this is an exteriorised, generalised, machinic, materialised and productive idea of unconscious affect.

> Assemblages are passional, they are compositions of desire … The rationality, the efficiency, of an assemblage does not exist without the passions the assemblage brings into play, without the desires that constitute it as much as it constitutes them (Deleuze and Guattari 1987, 399).

Deleuze (1991) was seeking to de-individualise Hume's (1986 [1740]) idea of passion being the driver of reason and to place passion into the deeper immanent potentialities and emergence of assemblages and production of desire in 'desiring machines' within a broader critique of capitalism, liberalism and modernity (Deleuze and Guattari 1987). This productive, machinic, materialised desire is implicated in capitalist modernity in the way that identities, locations and unconscious drives are fractured and recombined to serve forms of capitalist accumulation.

The emphasis on emotion and affect is reflected across human geography as a whole (O'Grady 2018; Thein 2005; Pile 2010) influenced in various ways by critical theory and psychoanalysis; poststructuralism and a turn to embodied geographies. I have suggested how this distributed idea of affect and emotion is shared by pragmatism: material-organic 'situations' can be 'fearful', 'doubtful', 'joyous', desiring, but, from this perspective, affect too is continuous with distributed idea of problematisation and reasoning. These are phases of activity in situations of ongoing life, comprising materials and objects, human and non-human organisms. They are not an ontological ordering[3] (in contrast Deleuze for whom 'desire' and its production is the key force). Affect is indeed distributed and situational but is also in a continuum with other phases of distributed action that include sub-conscious habit (again a more generalised, non-individual human disposition that contains environmental structures), as well as that phase of action known as thinking (social communication).

Pragmatism for geography

Geography has moved towards privileging these wider, distributed forces of affect but at the same time has held on to the tradition idea of reason – as cognitive, individual and instrumental: an exercise of sovereign will. In contrast, in more vital environments with a greater plurality of actants, pragmatism recognises the role of mind, reflection and reason as also more distributed across 'situations' and environments. In this way pragmatism offers the potential for geography to re-situate human reasoning in a more naturalistic register with a greater sensitivity to the environments and relationalities of thinking, in ways that philosophers of science have already discussed through ideas of 'distributed cognition' and 'extended minds' (Godfrey Smith 2002; Clark 2008). This would help rebalance inquiry in human geography to take account of the effects of reflective and communicative action, alongside the current emphasis on affect and emotion

Affect, thinking and habits are also subject to the wider forces of a nonhuman environment. Geographers have done much to acknowledge this worldliness, a world beyond humans, demonstrated in these ideas of assemblage, 'vital' or 'more-than-human' environments and post-human geographies. Environmental forces insinuate themselves into human bodies via habit

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[3] This is reflected in a continuing debate in geography on the ontological status of assemblage theory – see Rogers (2018) for a recent contribution.

routines that compose the body in various ways. These have been traced in geography through investigations of, for instance, landscapes of military drill (Dewsbury 2015); long distance air travel (Bissell 2015); transport planning (Schwanen et al, 2012); art encounter (Lapworth 2015) and mindfulness therapy (Lea et al 2015). Yet rather than a vitalist, there is also a pragmatist, understanding of this worldliness (an environment at once 'precarious and stable' Dewey 1981, see Rogers 2012). Colebrook (2015) calls this an 'inhuman pragmatism': "a pragmatism that is not complacently *for us*" (p264, emphasis in original) but subject to the multiple finitudes of the forces that encompass humans. She sees this as a pragmatism of genesis, which brings Dewey's and Deleuze's ideas closer together:

> For Dewey pragmatism is a genetic enterprise that allows us to see both the intellect and emotions as abstractions from complicated response networks: humans emerge from a contraction of habits, which are stabilised from unthinking networks of relations. There is one sense is which we can tie both Deleuze and Dewey to a broad Nietzschean approach to thinking about all aspects of life in terms of forces, such that what one believes and what one does make sense only as an aspect of a plane of relations that goes beyond the self. (Colebrook, 2015, 258-9)

Dewey one hundred years ago was thus concerned with human experience, habits, situations, problematisations and action *given* all these assumptions about prevailing contingencies "and dependence on forces that go their own way without our wish and plan" (Dewey 1983, 200). Pragmatism acknowledges an environment that is active, co-implicating organisms and objects in transactions which 'call out' complexes of human action in space and time. He was asking how human experience and reasoning function given an understanding of this more vital environment. The way that environment 'calls out' has consequences for human communication and participation, which, via linguistic complexes, involve commitments and responsibilities for action that extend and ramify the effects. This is the limited, but specialised, nature of human experience in networks/assemblages and explains why, where it does operate, it tends to "render other of nature's precincts accessible" (Dewey 1981: 11-12). Problematisation involves enduring and extensive situations, which are collectively drawn into selective application and emphasis through enquiry into problematic situations. This suggests how time-spaces are heterogeneously connected into assemblages enabling action-at a-distance and 'distance-at-an-action': distance- (in time and space of the multiple environments of human experience)-at (or attending to)-an-action'.

The consequences of pursuing a more thoroughgoing pragmatism in relation to ANT and assemblage theory is to further naturalise these approaches (with a radical empiricism) and also to set them in the context of the effects of human experience on networks of relations in emergent assemblages. This emphasis on transaction, experience and situation I think posits an idea of space that is hyper-relational (beyond the claims of ANT or assemblage theory) but at the same time identifies certain time-space orderings that come with the pragmatist idea of human experience. These have implications for progress in human geography more widely.

As we have seen, geographers have already travelled some way down the road of moving to a more pragmatist-inflected idea of relational space. Although not arguing from a pragmatist perspective, Massey (2005) argues that space is not prior to identities/entities but is a constitutive

part of interrelations. It is not a container against which relations between organisms and objects are established or broken. For Massey 'the chance of space' is as a combination of purposiveness and contingency arising from simultaneous heterogeneity of objects and organisms, involving surprising juxtapositions and interactions. This focus on relations in conditions of uncertainty has a very pragmatist tone. From a pragmatist viewpoint I suggest that interrelations (transactions) are not purely topological (the key register of relational geographies); they are not simply the connections between formed objects and discrete organisms with these relations possessing different levels of intensity or action-at-a-distance. As well as not being prior to entities or organisms nor is space simply composed of their interrelations but is part of their ongoing constitution. There are no nodes in the topology, only bundles of energy with fuzzy boundaries distinguished by different qualities of transactions. So, rather than being object nodes or organism nodes in a topology in which space is characterised by the configuration of their interrelations with different intensities, space is part of the constitution of the nodes. This relates back to Dewey's (1981) claims about the organism being defined not by its constitutive elements and organic unity or integrity, but by its connections to other things (or more strictly ongoing events). We should see space as much more field-like, with blurred edges but nevertheless where those edges/peripheries are radically open and contingent.

I think Dewey is pulling us towards an idea of space as field, or a series of overlapping fields, through his central idea of 'situation'. As we have seen, situations are defined by 'togetherness' in which no constituent entities or organisms have priority but nevertheless where there is an overall operative unity or coherence. Situations or fields themselves are not like Venn diagrams or force fields but have transpositional qualities. They can be "extensive" in space and "enduring' in time, distanciated and loose, but then, as contingencies and interrelations interrupt the functioning of human organisms, this situation becomes problematic. The multiplicity of times and spaces of diverse environments of ramifying human experience are selectively compressed through inquiry into the problematic situation (distance-at-an-action) producing new virtualities and ramifying its effects (action-at-a-distance) making 'other of nature's precincts' available" (1981, 213). Diverse time-spaces are not just 'folded' (in Deleuzian terms), but rather 'situated' through the operation of human experience (socialised and embodied). Space acts as both background (extensive-enduring situation) and foreground (problematic situation). In some cases this may coincide with more traditional conceptions of space. Thus Cutchin (2008) argues powerfully for 'place' as a "situated problematic". It is "localized and immediate in nature" but "it must stretch with us. This is one of the reasons place is so hard to define and bound" (Cutchin 2008, 1565).

I suggest that place is just one manifestation of a situated problematic. There can be situated problematics that are 'localised', specialist and specific but are spatially distanciated (traced in many studies of the effects of globalisation for instance). Equally there are 'situated' problematics, that are a response to the emergence of specific problematisations at a particular place and time, that become extensive in space and time. Here there are connections to what one can see as the pragmatist strains of Foucault's understanding of pragmatics of problematisation (Foucault 1998, see also Koopman 2011; 2018) and the way that problems become defined in discursive regimes operating in institutional forms such as public health (Foucault 2006); criminology and penology (1977) and sexuality (1986). Foucault's work also

reminds us of the range of spatialities involved, from the extensive discursive institutional regimes themselves to the specificities of space corporealized in discursive analysis and confinement of bodies. There are rich possibilities for research in human geography in investigating space through the pragmatics of problematisation (Barnett and Bridge 2017). This work also continues to develop the synergies between pragmatist and continental philosophy, a re-balancing that certain neo-pragmatists, such as Bernstein (1991), have long been calling for with some indeed favouring pragmatism, with "James and Dewey waiting at the end of the road which … Foucault and Deleuze are currently travelling" (Rorty 1982 xviii).

The emphatic space of problematisation leads to experimentation. Entities and relations in the problematic situation are manipulated in ways that are active and operational. Relations are adjusted and, because of its constitutive role, space is part of this experimentation. These spatial experiments have already been recognised in geography in various ways. From a pragmatist perspective Allen (2016) shows how experiments with relations and interconnections (changing the topology) can, for example, give social movements temporary grips on power in a globalised world - directly connecting western clothing consumers to producers through anti-sweatshop campaigns. Equally, he argues, spatial experiments can also draw together dispersed publics through shared experience (especially in relation to power). However, there is a further element to the relationalities of space beyond topologies which is the renewal of the experience of space through practice. The artist Olafur Eliasson celebrates the idea of the relationality of space through human communication but also through the experience of the actualisation of space (Jellis 2015). This relates much more generally to "how people are related practically to the world, in different situations, by mobilising space" (Lussault and Stock 2010, 17). Using French 'pragmatic sociology of critique' in which critique involves judgements that are situational, plural and dialogical, Lussault and Stock see the pragmatics of space seen as "a resource and condition of practice, mobilised in situations through 'proofs' (17): what they intriguingly depict as proofing space (as in experimenting, but also testing the resilience of, space, as strategy and justification). In this way spatial experiments are a constant feature of human life. I suggest this is a further element of hyper-relationality in which the topologies of actor networks or emergent assemblages are complicated by the *plurality* of sites of critique and 'proofings' of space. This does not necessitate acceding to the separateness of spatial ontologies (witnessed in the ontological turn in geography) but rather to acknowledge how space is proofed in everyday practice within different worldviews as well as between them. It is to acknowledge the contingent and provisional nature of space in human activity and the importance of dialogical engagement in judgement over that activity with critique as a proofing of space. Spatial pragmatics implicate co-constitutive relations in the contingencies of space which arise from problematisations. They involve spatial experiments and agonistic trials (or proofings) from plural sites of critique and experience. In this way they constitute the ingredients for more radically democratic projects (Lussault and Stock; Barnett and Bridge 2013).

Conclusions

The implications of a more sustained application of pragmatism to ANT and assemblage theory in geography are to suggest a more radically empirical pathway for human geography as a whole.

It means moving away from more transcendent impulses in the discipline (illustrated in assemblage theory in ideas of exteriority of relations, (de)territorialisation, virtuality as immanent becoming). It also re-situates human activity in a more 'vital' environment. It both acknowledges the effects of acting things (human, nonhuman, objects) as well as the more distributed and environmentally embedded characteristics of experience, 'mind' and reason. This also helps rebalance contemporary geographical accounts of human action (with its current, more exclusive focus on affect and emotion) without resorting to Cartesianism. It also offers a provisional realism in acknowledging a worldly environment comprising forces that "go their own way without our wish or plan" (Dewey 1983, 200) with a renewed emphasis on problematisation and experimental action. Pragmatism here takes in aspects of the flatter ontology that has become more pervasive in geography, to the extent that humans are amongst other actants (to use ANT language). However, being part of a 'problematic situation' of which humans are one part, through problematisation, potentially involves transformation of the human organism (self and others) as part of resolution of the situation as a whole (a basis for radical democratic action). So, pragmatism offers geography a less hierarchical view of human nature (than Cartesianism or variants of idealism for instance) whilst acknowledging the distinctive traits of human experience and action at work in nature. Problematic situations (of which humans are the problematising part) have hyper-relational consequences in time-space (beyond topological space). This involves both action-at-a-distance as well as 'distance (from the wider time-space situation)-at (or attending to)-an-action'. As a constitutive component of organism-environment transactions it involves the contingencies of situated spatial experiments. ANT and assemblage have started on this road of understanding situations. A fully pragmatist human geography could take this much further with renewed focus on a (more modest, relational, distributed) idea of human 'reasonings' through action.

References

Allen J (2008) Pragmatism and power, or the power to make a difference in a radically contingent world. *Geoforum* 39(4): 1613-24.

Allen J (2016) *Topologies of Power: Beyond Networks and Territories.* London: Routledge.

Anderson B, Keanes M, McFarlane C, Swanton D (2012) On assemblages and geography. *Dialogues in Human Geography* 2(2): 171-89.

Anderson J (2009) *Understanding Cultural Geography: Places and Traces.* London: Routledge.

Austin A L (1962) *How To Do Things With Words.* (ed J O Urmston) Cambridge MA: Harvard University Press.

Baert P (2005) *Philosophy of the Social Sciences: Towards Pragmatism.* Cambridge: Polity.

Barnes T J (2008) American pragmatism: Towards a geographical introduction. *Geoforum* 39(4): 1542-1554.

Barnett C, Bridge G (2013) Geographies of radical democracy: Agonistic pragmatism and the formation of affected interests. *Annals of the Association of American Geographers* 103(4): 1022-1040.

Barnett C, Bridge G (2017) The situations of urban enquiry: Thinking problematically about the city. *International Journal of Urban and Regional Research* 40 (6): 1186-1204.

Bennett J (2010) *Vibrant Matter: A political ecology of things.* Durham: Duke University Press.

Bernstein R (1991) *The New Constellation: The Ethical-Political Horizons of Modernity/Postmodernity.* Cambridge: Polity.

Bernstein R (2010) *The Pragmatic Turn.* Cambridge: Polity.

Bignall S (2015) "Every existence is an event": Deleuze, Dewey and democracy. In: Bowden S, Bignall S and Patton P (eds) *Deleuze and Pragmatism.* London: Routledge, pp. 105-123.

Bissell D (2015) Virtual infrastructures of habit: the changing intensities of habit through gracefulness, restlessness and clumsiness. *cultural geographies* 22 (1): 127-146.

Bowden S, Bignall S, Patton P (2015) Deleuzian encounters with pragmatism. In: Bowden S, Bignall S and Patton P (eds) *Deleuze and Pragmatism.* London: Routledge, pp.1-17.

Brandom R (1998) *Making It Explicit: Reasoning, Representing, and Discursive Commitment.* Cambridge MA: Harvard University Press.

Bridge G (2005) *Reason in the City of Difference: Pragmatism, Communicative Action and Contemporary Urbanism.* London: Routledge.

Bridge G (2008) City senses: On the radical possibilities of pragmatism in geography. *Geoforum* 39(4): 1570-1584.

Bridge G (2019) Habit, experience and environment: A pragmatist perspective. *Environment and Planning D: Society and Space* DOI: 10.1177/026377582715

Clark A (2008) *Supersizing the Mind: Embodiment, Action and Cognitive Extension.* Oxford: OUP

Cloke P, Cook I, Crang P, Goodwin M, Painter J, Philo C (eds) (2004) *Practising Human Geography* London: Sage

Colebrook C (2015) Pragmatic finitudes. In: Bowden S, Bignall S and Patton P (eds) *Deleuze and Pragmatism.* London: Routledge, pp. 252-268.

Cutchin M P (2008) John Dewey's metaphysical ground map and its implications for geographical inquiry. *Geoforum* 39(4): 1555-1569.

DaLanda M (2016) *Assemblage Theory.* Edinburgh: Edinburgh University Press.

Deleuze G (1991) *Empiricism and Subjectivity: An Essay on Hume's Theory of Human Nature.* (translated by Boundas C). New York: Colombia University Press.

Deleuze G (2002) *Dialogues.* (translated by Tomlinson H and Habberjam B) London: Continuum.

Deleuze G and Guattari F (1987) *A Thousand Plateaus*. Minneapolis: University of Minnesota Press.

Dewey J (1896) The reflex arc concept in psychology. *Psychological Review* 3: 357-370.

Dewey J –
- (1981) *The Later Works 1925-1953 Volume 1 1925: Experience and Nature*
- (1984) *The Later Works 1925-1953 Volume 2 1925-27: Essays, Reviews and Miscellany, and The Public and Its Problems*
- (1988) *The Later Works 1925-1953: Volume 4 1929: The Quest for Certainty*
- (1986) *The Later Works 1925-1953 Volume 10 1934: Art as Experience*
- (1986) *The Later Works 1925-1953: Volume 12 1938: Logic: The Theory of Enquiry*
- (1991) *The Later Works 1925-1953: Volume 14 1939-41: Essays, Reviews and Miscellany*
- (1989) *The Later Works 1925-1953: Volume 16 1949-52: Essays, Typescripts and Knowing and the Known*
- (1983) *The Middle Works 1899-1924 Volume 14 1922: Human Nature and Conduct*

all edited by Jo Ann Boydson Carbondale: Southern Illinois University Press
-

Dewey J and Bentley A (1991 [1949]) 'Knowing and the Known' in *Later Works, Volume 16* edited by Jo Ann Boydson Carbondale: Southern Illinois University Press.

Dewey J (2012) *Unmodern Philosophy and Modern Philosophy*. Dean P (ed) Carbondale: Southern Illinois University Press.

Dewsbury J-D (2011) The Deleuze-Guattarian assemblage: Plastic habits. *Area* 43(2): 148-153.

Dewsbury J-D (2015) Non-representational landscapes and the performative affective forces of habit: from 'Live' to 'Blank'. *cultural geographies* 22 (1), 29-47.

Dittmer J (2013) Geopolitical assemblages and complexity. *Progress in Human Geography* 38(3) 385-401.

Duffey P, Stojanovic T (2018) The potential for Assemblage thinking in population geography: Assembling population, space and place. *Population, Space and Place* 24(3): e2097.

Farias I (2011) The politics of urban assemblages. *City* 15(3-4) 365-74.

Farias I and Bender T (2010) *Urban Assemblages: How Actor Network Theory Changes Urban Studies*. London: Routledge.

Foucault M (1998) Polemics, politics and problematizations. *Ethics, Subjectivity and Truth*. Rabinow P (ed), (translated Hurley R) New York: The New Press, pp. 111-121.

Foucault M (1977) *Discipline and Punish: The Birth of the Prison*. New York. Pantheon.

Foucault M (1986) *The Use of Pleasure. The History of Sexuality vol 2*. London: Penguin Books.

Foucault M (2006) *Madness and Civilisation: A History of Insanity in the Age of Reason*. London: Vintage Books.

Fuller C (2016) City government in an age of austerity: Discursive institutions and critique. *Environment and Planning A: Economy and Space* 49(4): 745-766.

Garrison J (1999) John Dewey, Jacques Derrida and the metaphysics of presence. *Transactions of the Charles S Peirce Society* 35(2): 346-372.

Godfrey-Smith P (2002) Dewey on naturalism, realism and science. *Philosophy of Science* 63(3): S25-35.

Goodman R (2012) William James's pluralisms. *Revue internationale de philosophie* 260 (2) 155-176.

Harney L, McCurry J, Scott J, Wills J (2016) Developing 'process pragmatism' to underpin engaged research in human geography. *Progress in Human Geography* 40(3): 316-333.

Hennion A, Muecke S (2016) From ANT to pragmatism: a journey with Bruno Latour at the CSI. *New Literary History* 47: 289-308.

Hepple L W (2008) Geography and the pragmatic tradition: The threefold engagement. *Geoforum* 39(4): 1530-1541.

Hoch C (2019) *Pragmatic Spatial Planning: Practical Theory for Professionals.* London: Routledge.

Healey P (2009) The pragmatic tradition in planning thought. *Journal of Planning Education and Research* 28(3): 277-292.

Hume D (1986) *A Treatise on Human Nature.* Harmondsworth: Penguin.

Jackson P, Smith S J (1984) *Exploring Social Geography.* London: Allen and Unwin.

James W (1977) *The Writings of William James: A comprehensive edition.* McDermott J J (ed) Chicago: Chicago University Press.

James W (2012) [1909] *A Pluralistic Universe.* Portland, Or: The Floating Press.

Jarolmack C, Tavory I (2015) Molds and totems: Nonhumans and the constitution of the social self. *Sociological Theory* 32(1): 64-77.

Jellis T (2015) Spatial experiments: Art, geography, pedagogy. *cultural geographies* 22(2):369-74.

Jones O (2008) Stepping from the wreckage: Geography, pragmatism and anti-representational theory. *Geoforum* 39(4): 1600-1612.

Kamalipour H, Peimani N (2015) Assemblage thinking and the city: Implications for urban studies. *Current Urban Studies* 3: 402-408 published online.

Koczanowicz L (2016) Bruno Latour, American Pragmatism and the idea of nonhuman democracy. *Pragmatism Today* 7(2): 60-65.

Koopman C (2011) Genealogical pragmatism: how history matters for Foucault and Dewey. *Journal of the Philosophy of History* 5(3): 533-561.

Koopman C (2018) Problematisaion in Foucault's genealogy and Deleuze's symptomatology, or how to study sexuality without invoking oppositions. *Angelaki* 23(2): 187-204.

Lapworth A (2015) Habit, art, and the plasticity of the subject: the ontogenetic shock of the bioart encounter. *cultural geographies* 22 (1) 85-102.

Lea J, Cadman L and Philo C (2015) Changing the habits of a lifetime? Mindfulness meditation and habitual geographies. *cultural geographies* 22 (1) 449-65.

Lake R (2017) For creative democracy. *Urban Studies* 38(4): 507-511.

Latham A, McCormack DP (2004) Moving Cities: Rethinking the materialities of urban geographies. *Progress in Human Geography* 28(6): 701-24.

Latour B (2004) *The Politics of Nature: How to Bring the Sciences into Democracy.* Cambridge MA: Harvard University Press.

Latour B (2007) *Reassembling the Social.* Oxford: Oxford University Press.

Latour B (2008) A textbook case revisited – Knowledge as a mode of existence. In: Hackett E, Amsterdamska O, Lynch M and Wacjman J (eds) *The Handbook of Science and Technology Studies.* Cambridge MA: MIT Press, pp.83-112.

Ley D, Samuels M (eds) (1978) *Humanistic Geography: Problems and Prospects.* London: Croom-Helm.

Light A and Katz E (eds) (1996) *Environmental Pragmatism.* London: Routledge.

Lussault M, Stock M (2010) "Doing with space": towards a pragmatics of space. *Social Geography* 5: 11-19.

Madelrieux S (2015) Pluralism without pragmatism: Deleuze and the ambiguities of the French reception of James. In: Bowden S, Bignall S and Patton P (eds) *Deleuze and Pragmatism.* London: Routledge, pp.89-104.

Massey D (2005) *For Space.* London: Sage.

McFarlane C (2011a) Assemblage and critical urbanism *City* 15 (2) 204-224

McFarlane C (2011b) The city as assemblage: Dwelling and urban space *Environment and Planning D: Society and Space* 29: 649-671.

McGuirk P, Mee K J and Ruming K (2016). Assembling urban regeneration? Resourcing critical generative accounts of urban regeneration through assemblage. *Geography Compass* 10(3), 128–141.

McDowell R (1996) *Mind and World.* Cambridge, MA: Harvard University Press.

Malecki W, Schleusener S (2015) 'What effects are you capable of?' On Deleuze and Somaesthetics. In: Bowden S, Bignall S and Patton P (eds) *Deleuze and Pragmatism.* London: Routledge, 216-234.

Marres N (2007) The issues deserve more credit: Pragmatist contributions to the study of public involvement in controversy. *Social Studies of Science* 37 (5) 759-780.

Massumi B (2015) *The Politics of Affect.* London: Polity Press.

Minteer B (2012) *Refounding Environmental Ethics: Pragmatism, Principle and Practice.* Philadelphia: Temple University Press.

Muhit MA (2013) Notion of experience in John Dewey's philosophy *Philosophy and Progress* 5(1-2): 9-24.

Muller M (2015) Assemblages and actor networks: Rethinking socio-material power, politics and space. *Geography Compass* 9(1): 27-41.

Muller M and Schurr C (2016) Assemblage thinking and actor network theory: conjunctions, disjunctions, cross fertilisations. *Transactions of the Institute of British Geographers* 41 (3) 217-229.

Norton B G (1984) Environmental ethics and weak anthropomorphism *Environmental Ethics* 6: 131-148.

O'Grady N (2018) Geographies of Affect. *Oxford Bibliographies* DOI: 10.1093/OBO/9780199874002-0186

Pappas G (2008) *John Dewey's Ethics: Democracy as Experience.* Bloomington: Indiana University Press.

Patton P (2016) Deleuze and Naturalism. *International Journal of Philosophical Studies* 24 (3): 348-364.

Pedwell C (2016) Transforming habit: revolution, routine and social change. *Cultural Studies* 31 (1): 93-120.

Peirce C S (1992) [1878] *The Essential Peirce: Selected Philosophical Writings Volume 1 (1867-1893).* Houser N and Kloesel C (eds) Bloomington: Indiana University Press.

Peirce C S (1998) *The Essential Peirce: Selected Philosophical Writings Volume 2 (1893-1913).* Bloomington: Indiana University Press.

Pile S (2010) Emotions and affect in recent human geography. *Transactions of the Institute of British Geographers* 35(1): 5-20.

Prince R (2016) The spaces in between: Mobile policy and the topographies and topologies of the technocracy. *Environment and Planning D: Society and Space*, *34*(3), 420–437.

Robbins P and Marks B (2010) Assemblage geographies. In: Smith S, Pain R, Marsden S and Jones J-P (eds) *The Sage Handbook of Social Geographies* London: Sage, pp.176-194.

Rogers D (2018) Assemblage theory and the ontological limits of speculative realism. *Dialogues in Human Geography* 8(2): 244-247.

Rogers M L (2012) *The Undiscovered Dewey: Religion, morality and the ethos of democracy.* New York: Columbia University Press.

Rorty R (1982) *Consequences of Pragmatism.* Minneapolis: University of Minnesota Press.

Schwanen T, Banister D and Anable J (2012) Rethinking habits and their role in behaviour change: the case of low-carbon mobility. *Journal of Transport Geography* 24: 522-532.

Sellers W (2007) *In the Space of Reasons: Selected essays of Wilfrid Sellers.* edited by Scharp K and Brandom R Cambridge MA: Harvard University Press.

Smith T (2017) Witchcraft, spiritual worldviews and environmental management: Rationality and assemblage *Environment and Planning A: Economy and Space* 49 (3): 592-611.

Shusterman R (2000) *Pragmatist Aesthetics: Living Beauty, Rethinking Art.* (2nd. Edn). Oxford: Rowman and Littlefield.

Shusterman R (2008) *Body Consciousness: A Philosophy of Mindfulness and Somaesthetics.* Cambridge: Cambridge University Press.

Shusterman R (2012) *Thinking Through the Body: Essays in Somaesthetics.* Cambridge: Cambridge University Press.

Sullivan S (2001) *Living Across and Through Skins: Transactional Bodies, Pragmatism and Feminism.* Bloomington and Indianapolis: Indiana University Press.

Thein D (2005) After or beyond feeling? A consideration of affect and emotion in geography. *Area* 37(4): 450-456.

Thrift N (2007) *Non-representational Theory: Space, Politics, Affect.* London: Routledge.

Weston A (1985) Beyond intrinsic value: Pragmatism and environmental ethics. *Environmental Ethics* 7: 321-339.