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What is This?

Geopolitical assemblages and complexity

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Abstract
This article proposes a framework for considering materiality in the field of geopolitics: assemblage and complexity theories. Drawing on literatures beyond the field to imagine a posthuman geopolitics, this article argues for a relational ontology that emphasizes the complex interactions among the elements of an assemblage. These interactions produce emergent effects which themselves reshape the assemblage's elements. This has implications for understandings of agency, subjectivity, and systemic change. The article concludes by highlighting the methodological and ethical challenges that such a project would face.

I Rethinking the material in geopolitics

Geopolitics is a field of study that has struggled with the topic of materiality. Early geopolitics was explicitly materialist in its adherence to environmental determinism, viewing the eternal dynamics of international relations as following from the permanence of landscape and climate. Understanding the strategic importance or limitations of a given territory was understood as advantaging one state in their competition with others (e.g. Mackinder, 1904; Whittlesey, 1939). Post-Second World War geopolitics maintained this emphasis (Cohen, 1973), with some efforts to model these dynamics better through abstraction and quantification (O'Sullivan, 1982). In this formulation geopolitics is the outcome of material concerns, such as the role of mountains in disrupting 'force fields' through which power is projected from national capitals. Another type of materialism emerged in the 1970s with the engagement of political

geography with world systems theory (Flint, 2012; Taylor, 1982), which sees geopolitics as the global struggle to control the distribution of material resources, including natural resources and human labor. This focus on the materiality of capitalism has been maintained to the present in a consistent strand of research (Cowen and Smith, 2009; Mercille, 2008).

Beginning in the early 1990s, however, the project of critical geopolitics pushed back against this materialism, emphasizing textual discourse as part of a new geopolitical ontology (see Kelly, 2006). The past century of geopolitical thinking in the service of empire and superpower was thoroughly analyzed, critiqued, and located within specific contexts and biographies (Bassin, 1987; Dodds and Atkinson, 2000; Kearns, 2009;

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Ó Tuathail, 1996; Smith, 2004), with geography not found in the material landscape or the flows of capital but in the *representations* of the material world. Of course, this was not a complete dematerialization; some scholars paid attention to the material circulation of the texts themselves (Dittmer and Dodds, 2008; Dodds, 2006), while Dalby (1992, 1993, 2002, 2007, 2009) maintained a consistent interest in the relationship between militarism and environmental security (see also Grove, 2010). A wide array of materialities has been introduced alongside these in recent years, from urban infrastructure and design (Graham, 2004, 2009) to disease and public health (Ingram, 2005, 2008) and affect and anticipation (Anderson, 2010; Anderson and Adey, 2011). Of course, alongside these increasingly sophisticated accounts of materiality there remain accounts written by disciplinary outsiders that maintain the crude environmental determinism of early geopolitics (Dolman, 2001; Kaplan, 2012).

Aversion to the early environmental determinism of geopolitics has embedded a healthy skepticism about the role of the material in geopolitical thought, although clearly there have been many ways to incorporate materiality over the years. There is, as Tolia-Kelly (2011) notes in her recent review, always the risk of reducing materiality to surface – of gesturing to it while refusing to consider it in a sustained and sensitive fashion. In this paper I draw from recent work in other parts of human geography (especially cultural, urban, and environmental geography) and beyond (science and technology studies, international relations, political theory, and philosophy, among others) to offer a way forward (assemblage and complexity theory) that enables us not so much to pick our way through old minefields such as environmental determinism, structure/ agency, and scale as to sidestep them altogether. Further, the approach that I advocate connects with arguments for geopolitics as everyday practice (Dittmer and Gray, 2010; Sharp, 2007) and as a local, bottom-up set of processes that need

to be studied as such – via disaggregation and attention to both specific sites and events (Ó Tuathail, 2010; see also Shaw, 2012). Finally, this approach also provides a language for understanding and engendering progressive geopolitical change, speaking to a common critique coming from feminist geopolitics (Hyndman, 2001).

This paper proceeds in four sections. In the first, I outline assemblage theory, highlighting areas where extant work in geopolitics points towards assemblages and importing ideas and concepts where there are few antecedents. Beyond this outline, I argue that assemblages allow for a posthuman turn in geopolitics, incorporating animals, 'nature', and other objects into our understandings of the geopolitical. Further, I argue that assemblage embeds a relational ontology that dissolves the macro/micro scalar tensions at the heart of geopolitics. In the second section, I introduce complexity theory, which has a different trajectory in human geography to assemblage theory but still owes its recent resurgence to the rise of assemblage thinking. Beyond tracing this trajectory, I argue that complexity theory enables us to incorporate the environment and materiality into geopolitical analyses of change without lapsing into any of the determinism that plagues early geopolitical thought (and its neoclassical variants – see Megoran, 2010). The third section of this article describes the implications of this argument for the role of the subject in geopolitical thought. In the final section, I consider the implications of thinking geopolitics through assemblage and complexity theory, with an emphasis on ethics and methodology.

II Assemblage theory

There is a range of ways of 'thinking assemblage', each with different lineages and emphases (see Robbins and Marks, 2009, for a typology). Assemblage theory, as taken up in this review, is derived from the work of Deleuze and Guattari

(1987), which was later systematized by DeLanda (2006). Assemblages can be defined as 'wholes characterised by *relations of exteriority*' (DeLanda, 2006: 10; for an extended discussion, see Anderson et al., 2012). These relations of exteriority mean that component parts of a whole cannot be reduced to their function within that whole, and indeed they can be parts of multiple wholes at any given moment. The parts are nevertheless shaped by their interactions within assemblages, and indeed it is the *capacities*, rather than the *properties*, of component parts that are most relevant in understanding resultant assemblages. While the properties of a material are relatively finite, its capacities are infinite because they are the result of interaction with an infinite set of other components.

Such an approach to geopolitics is a key corrective to early German geopolitical theories that reduced the nation state to a body composed of its material organs, such as its sovereign (institutions and regime type), population (labor and military power), or natural resources (fertile land, minerals, petroleum, etc.). This metaphor of the organism, central to much political theory of the Enlightenment (Rasmussen and Brown, 2005), invested the body with relations of interiority rather than those of exteriority (Durkheim, 1915). For instance, Ratzel's organic theory of the state envisioned the state as deriving its power and vitality from its farmland and population resources (Bassin, 1987; Smith, 1980). Functionalist accounts such as this reduce a totality, such as the state, to the sum of its parts, without considering how those relationships are 'contingently obligatory' rather than 'logically necessary' (DeLanda, 2006: 11). Because of the contingency of the evolving body, an organism is more properly understood as an assemblage than as the archetype of functionalism. Crucially, not only is the organismal body an assemblage (Whatmore, 1997), but it is a component part of other geopolitical assemblages, such as the state, a mob, or a multiplayer networked video game: 'The components of social assemblages

playing a material role vary widely, but at the very least involve a set of human bodies properly oriented (physically or psychologically) towards each other' (DeLanda, 2006: 12).

While reconsidering the role of materiality in geopolitical assemblages is important, there are other roles to be played in the composition of assemblage. DeLanda argues that components of an assemblage can be defined on three axes: material/expressive, territorializing/deterritorializing, and coding/decoding. Any assemblage, composed of a heterogeneous mixture of constituent parts, will have a range of material and expressive components at any given time: 'These roles are variable and may occur in mixtures, that is, a given component may play a mixture of material and expressive roles by exercising different sets of capacities' (DeLanda, 2006: 12). A geopolitical example might be an interstate border; a border has various component parts that contribute varying material properties, such as a wall or the passport that licenses passage. Expressive components might include the biometric information contained in the passport or the legislation legitimating detention of suspected illegal immigrants (Coleman, 2009). As Deleuze and Guattari put it:

> There is no longer a tripartite division between a field of reality (the world) and the field of representation (the book) and the field of subjectivity (the author). Rather, an assemblage establishes connections between certain multiplicities drawn from each of these orders. (Deleuze and Guattari, 1987: 25)

The axis of territorialization/deterritorialization refers to the relative delineation of the assemblage from its neighbors. As with the material/expressive axis, any component can be working to territorialize the assemblage at any given moment, and soon thereafter exercise a capacity to deterritorialize it. To continue the example of the border, we might consider the biometric technologies that enable rapid transit of the border to be both deterritorializing in that they

make indistinct what is and is not part of the border (Amoore, 2006) and yet reterritorializing in that they can make the border entirely tangible for one caught up in their algorithms.

One way in which social assemblages become (de)territorialized is through coding/decoding: 'processes which consolidate and rigidify the identity of the assemblage or, on the contrary, allow the assemblage a certain latitude for more flexible operation while benefitting from generic or linguistic resources' (DeLanda, 2006: 19). This process has been known in critical geopolitics as discourse; however, in this more materialist, embodied form of geopolitics we must also include non-linguistic forms of coding, such as DNA. A final iteration of the border example will suffice – scholars of critical geopolitics have long noted that borders are uneven in their application, interacting with the coding of various bodies according to discursive logics of inclusion and exclusion (Popescu, 2011). Given that components of the assemblage come and go, and are constantly interacting with one another in ways that produce new capabilities, it is clear that assemblages are constantly in process, even when they seem stable and coherent (Anderson and McFarlane, 2011).

Assemblages are composed of more than just the material, however. The dynamism of assemblages means that a range of contingent futures is always possible. These 'lines of flight' (as Deleuze and Guattari, 1987, refer to them) are potentials inherent to any moment. However, just because they are unactualized does not mean that they are not real, nor incapable of impacting on the present. Indeed, recent work on anticipation emphasizes the way in which futures are brought into the present in order to remake the present – making these futures more or less likely (e.g. Anderson, 2010). These virtual presences are immaterial but nevertheless can be made present and acted upon.

There are two features of the assemblage approach that I would like to draw out here. First is its commitment to a posthuman geopolitics.

The early excesses of environmental determinism in geopolitics led to a complete disavowal of the role of environmental and biological materiality in geopolitical causation (for a more complete analysis, see Stallins, 2012). This traumatic experience, along with broader philosophical currents, embedded a profound humanism in our conception of politics. Alternative visions can today be found in non-representational conceptions of politics as always contextualized by material environments that pave the way for conscious thought and political decision-making. However, the material dimension of politics can also be found, expressed in quite different terms, by work in political ecology that has remained at the fringes of geopolitical thought. This work has emphasized the material properties of various natures (Le Billon, 2001), and has argued for the interrelationship of physical systems and human politics (Dalby, 2009). A more-than-human geopolitics has thus already begun to take root (if you will pardon the pun) in analyses of the mutual interactions of weeds and the War on Terror (Barker, 2010), the intersection of territorial airspace and atmospheric flows (Adey et al., 2011; Williams, 2010), and the proliferation of politicized geological knowledges around oil pipelines (Barry, 2013). This work shares a healthy skepticism about the primacy of the human in political matters, because of either the inherent vitalism of living things or the vibrancy of materials. As Bennett (2010: 112) puts it, 'materiality is a rubric that tends to horizontalize the relations between humans, biota and abiota' (see also Meehan et al., 2013).

The dissolution of the nature/culture divide (Latour, 1993) has profound implications for geopolitics that have yet to be explored (see, for example, Anderson, 1997). A posthuman geopolitics rooted in assemblage theory enables agency to be located in animals (Hobson, 2007; Wolch and Emel, 1998), objects (Braun and Whatmore, 2010), and environments (Mitchell, 2002). Of crucial importance to this move is that it entails no determinism at all. Rather, because power is

enacted through assemblage, it must be understood as distributed among the various components of that assemblage, human and non-human. That is to say, the properties and capabilities of non-human components of an assemblage shape outcomes in highly contingent ways (Whatmore, 2002). As Latour says:

> there might exist many metaphysical shades between full causality and sheer inexistence. In addition to 'determining' and serving as a 'backdrop for human action', things might authorise, allow, afford, encourage, permit, suggest, influence, block, render possible, forbid, and so on. (Latour, 2005: 72)

Of course, humans differ from (most) non-human components in that they exercise intentionality and reflexivity, and this is crucial to any analysis. However, it would be a mistake to see this as a *fundamental* difference, as this would disavow the embodied materiality of humanity that links us to the rest of the world (Protevi, 2009).

The second feature of an assemblage approach to geopolitics that I would like to draw out here is its commitment to a relational ontology. The scale debates of the past 15 years were sparked by questions about the rescaling of governance in an era of globalization, and the contestation of this frame by feminist scholars (Delaney and Leitner, 1997; Kurtz, 2003; Marston, 2000). While there has been no straightforward resolution to these debates, they have undoubtedly advanced the cause of relational ontologies, both within political geography (Painter, 2010) and in related fields (Allen, 2004, 2009; Marston et al., 2005). These ontologies take a range of forms, but can be understood to emphasize both specific sites and the relationships between them, a perspective shared by feminist and other scholars (Katz, 2001; McFarlane, 2009).

Relational ontologies are particularly important to scholars of non-representational theory, who posit bodies always in relation not only with one another but with other things:

> Affect is presented as an ontological layer of embodied existence, delimited by reference to the purely formal relationship of the capacity *to be affected* and *to affect*. In this presentation, affect is doubly located: in the relational in-between of fields of interaction; and layered below the level of minded, intentional consciousness. (Barnett, 2008: 188)

This concern with the mediation of affects has become an object of study within the previously avowedly representational popular geopolitics (Carter and McCormack, 2006, 2010), with analyses slowly shifting to incorporate understandings of various media networks (such as the broadband network on which the internet and video games now rely and the cinematic distribution network on which Hollywood relies) as infrastructures of affect (Dittmer, 2011; Dittmer and Gray, 2010; Shaw and Warf, 2009). In short, recent work in geopolitics (and elsewhere) has emphasized the scale of everyday life, albeit an everyday life that is produced through its translocal commitments (Jeffrey, 2013; Painter, 2006). Engagements such as this usefully situate scholars in critical geopolitics for a close examination of how components of an assemblage are specifically articulated in relation to one another, a key spatial dynamic of assemblage. Assemblage thinking 'foregrounds the ways in which social/political processes are generated through relations between sites, rather than configured through "internal relations" in sites' (Featherstone, 2011: 140).

Work in geopolitics has often struggled to negotiate the macro/micro divide. 'Traditional' geopolitics has tended to favor the authority of the global scale, seeing states' actions as shaped by their geographic situation, the capitalist system, and/or the global distribution of power. To the extent that individuals' agency is acknowledged, it tends to be that of statespersons and other elites. Critical geopolitics, while contrarian to much of the geopolitical tradition, has been criticized by feminist scholars for maintaining this elite-centric view of agency as constituted only at the largest scales (Dowler

and Sharp, 2001; Hyndman, 2001). Scholars of feminist geopolitics have argued that the long-standing emphasis in critical geopolitics on discourse has dematerialized geopolitics, leaving it the domain of (masculine) elites who make pronouncements which scholars then study. This critique of elite agency has been taken up by scholars writing in other traditions as well (Dittmer and Dodds, 2008; Müller, 2008), and cumulatively it can be said that an interest in the embodied agent has emerged. This 'body' is of course highly differentiated, both via sexual and a range of other differences (Colls, 2012), and may only be understandable in relation to other bodies. This latter position has been staked out by non-representational theorists (Pile, 2010), and refers to the transpersonal nature of affects which are understood to condition our subjectivities (Connolly, 2002). These recent developments, which emphasize the excess of agency in the human body, can be supplemented by the posthumanism of assemblage theory. When the anthropocentrism of geopolitical thought (whether critical or otherwise) is replaced with a wider notion of the political, we are left with a flat ontology whereby so-called 'macro' scales emerge out of interactions occurring at relatively 'micro' scales (Escobar, 2007). This resonates with, for example, criticisms of the 2003 Iraq invasion as the product of a parochial group of elites who organized 'stovepipes' to bring raw intelligence from the field directly to the Oval Office. As Latour argues in the context of actor-network theory:

> Macro no longer describes a wider or a *larger* site in which the micro would be embedded like some Russian Matroyoshka doll, but another equally local, equally micro place, which is *connected* to many others through some medium transporting specific types of traces. (Latour, 2005: 176)

The production of assemblage is thus a 'bottom-up' process. For example, consciousness, that which distinguishes human agency in traditional political thought, is the emergent effect of a human body's assemblage – an effect that can dissipate when that assemblage receives a right hook across the jaw, interrupting certain relations among bodily organs and systems. However, with this example, of both the concept of emergence and the possibility of interrupting or changing the relations of assemblage, it becomes crucial to introduce complexity theory.

III Complexity theory

Complexity theory first experienced a flurry of interest in human geography in the late 1990s as it was imported from the physical and environmental sciences (Thrift, 1999); it also had a brief moment in International Relations (Jervis, 1997). Manson (2001: 405) argues that there are three major divisions in complexity research: algorithmic complexity, deterministic complexity, and aggregate complexity. Of these, aggregate complexity offers the greatest opportunity for geopolitical scholarship, referring to the study of 'how individual elements work in concert to create systems with complex behavior'. This is not merely to say that systems are *complicated*. Rather, complexity refers to an understanding of systems as always dynamic and interacting in ways that defy attempts to model them. Small deviations or mutations at the micro scale can resonate with other events and lead to new, unexpected outcomes.

Complexity theory was criticized for being both too abstract and general to be of use (in that it can be applied to virtually all physical and social systems) or, paradoxically, too specific to produce general conclusions (in that each complex system is treated as a singularity). However, Manson and O'Sullivan (2006: 679) argue that the former criticism can be countered by the application of careful empirical research in specific contexts, a long-standing tradition among 'space and place researchers [who] are familiar with the problems of representing processes that vary in several dimensions and thereby call for nuanced specificity combined

with generalization'. Manson and O'Sullivan (2006: 681) dismiss the latter criticism with reference to the same strength of geographic research: 'However difficult it may be to generalize from the particular, anticipating the particular from the general is harder still. No amount of abstract theorizing can replace well-founded empirical investigation of phenomena in real-world settings' (for a geopolitical parallel, see Ó Tuathail, 2003b; Ó Tuathail and Dahlman, 2011). Despite these criticisms, complexity theory never disappeared, remaining visible in environmental and urban geography through to the present (Batty, 2005; Malanson et al., 2006; Phillips, 2004; Portugali, 2006; Stallins, 2006; Thrift, 2005).

Despite this early (if small) boom among human geographers, it is possible that complexity theory would fade as many intellectual fashions do. However, it received a boost from the rise of assemblage theory in the latter 2000s, with which it shares many similarities. For instance, both complex systems and assemblages are open to outside influences, as they are both defined by relations of exteriority. Also, both complex systems and assemblages are defined by their interactions; therefore both exceed the 'sum of their parts'. Third, they are historical in nature – each individual assemblage and complex system embeds its past in its compositional relationships: 'A system "remembers" through the persistence of internal structure ... Components and sub-systems with the capacity to accommodate the influx of energy, matter, and information from the environment will grow' (Manson, 2001: 410). This is true at multiple timescales: the complex system/assemblage of the human body bears witness to our evolutionary history (one might consider the appendix, for example) as well as short-term embodied memory (such as when you instinctively pull back from the stove that has burned you before). In these competing temporalities, we glimpse:

> multiple layers of the past resonat[ing] with things unfolding in the current situation, sometimes

issuing something new as if from nowhere. The new is ushered into being through a process that exceeds rational calculation or the derivation of practical implications from universal principles. (Connolly, 2010: 69)

The concept of emergence relies, after all, on a sense of the world as constantly becoming (Prigogine, 1980). The congruence of complexity theory and assemblage theory is important not only because it has infused complexity theory with currency, but also because complexity theory provides a conceptual language for understanding how assemblages work over time.

Complexity theory can be seen to have antecedents in general systems theory, which remains influential in political geography and international relations to this day. There is of course the already-mentioned literature on world systems theory (Flint, 2012; Taylor, 1982). There is also a French variant of systems thought, the most recent of which attempts to model geopolitics in five dimensions: physical geography, demography, state action, globalizing economics, and globalizing culture (Dussouy, 2010). A similar initiative to bring together the various human and physical dimensions of world politics can be seen in the discipline of International Relations (Buzan and Little, 2000). Systems thought remains a minority concern in Anglophone geopolitics, but these frameworks remind geopolitical scholars of the vast range of material and immaterial factors that shape the political world, many of which remain outside of current analyses:

> By juxtaposing the environmental, the economic, the demographic, the strategic, and the cultural/ideological, [systems thought] encourages exploration of matters that are just beginning to attract attention of geopolitical scholars, but that have great potential as areas of significant inquiry (e.g. the geopolitical implications of environmental change). (Murphy, 2010: 155)

Complexity theory retains the anti-reductionist aims of systems theory, but has key differences

(Manson, 2001). First, rather than assuming that systems are at equilibrium under most circumstances, complexity theory assumes constant, non-linear change with relations among elements of the system differing qualitatively over time. Second, complexity theory emphasizes that complex behavior can be produced out of relatively simple relations among elements of the system. Finally, complexity theory assumes that systems are open rather than closed, and are therefore shaped by neighboring systems.

Systems defined by complexity are understood as self-organizing; this does not refer to being directed by a self (although such reflexive behavior is possible following the emergence of a self), but rather it indicates that order can come from disorder without any form of governance. To maintain this order, complex systems tend to become more complex rather than less as they accommodate their environments. However, they can suddenly dissipate (deterritorialize, in Deleuzean/DeLandan terms) before taking on a new structure, perhaps with a completely different coding. For instance, Manson (2001) gives the example of the industrial revolution, which dissipated the old economy and geopolitics before reterritorializing them in new forms. However, what really marks off complexity theory off is a concept against which we have brushed up several times thus far: emergence. Indeed, Thrift (1999: 33) refers to complexity theory as 'the idea of a science of holistic *emergent* order'. Emergence refers to 'qualities that are not analytically tractable from the attributes of internal components' (Manson, 2001: 410), but that instead 'can now be explained as an effect of the causal interactions between its component parts' (DeLanda, 2011: 3). Recalling that assemblages are produced through the interactions of constituent parts, but exceed the sum of those parts, we can see how emergence is the key to understanding how assemblages seem to take on the status of something new and unpredicted vis-a-vis what was 'there' prior to emergence. DeLanda (2011) offers many examples of emergence: the development of life from non-

life, the origins of language, the rise of archaic states. In each case, pre-existing components interacted in contingent ways that produced a new assemblage.

Therefore, assemblages are emergent wholes defined by their properties, tendencies, and capacities. Properties refer to actualized features of the assemblage. In geopolitical terms, we might think of a diplomatic service: a country either does or does not have an embassy within a foreign country. This is a property of that state assemblage. Capacities, by contrast, may be actual or virtual because they refer to a set of outcomes rooted in the properties of both that diplomatic service *and* the other assemblages with which that diplomatic service is interacting: 'Thus, while properties can be specified without reference to anything else capacities to affect must always be thought in relation to capacities to be affected' (DeLanda, 2011: 4). Can the embassy produce the desired outcome? This depends, crucially, not only on the properties of the embassy but on the other government. This relative openness of capacities in relation to properties is what enables a materialism without determinism. Of course, just because the capacities are nearly infinite for any given assemblage does not mean that they are all equally likely. Here we encounter tendencies. Tendencies are discovered via mapping the structure of a multidimensional 'possibility space'. Indeed, complexity theory has grown in part because of the possibility of new computing technologies to simulate many possible interactions and map these possibility spaces in a way that is not particularly amenable to geopolitics. However, recall that the nature of complexity theory is that these relations among components are qualitative in nature; there is plenty of room for geopolitical methodologies to analyze these possibility spaces without attempting to quantify all of the dimensions:

> Even without quantitative information [about all the dimensions] we can get a sense of the qualitative characteristics of a landscape: whether it has

a single global optimum or many local optima, for example, or whether the neighborhood of those singularities is smooth or rugged. (DeLanda, 2011: 51)

What is needed, then, is an understanding of how these possibility spaces might inform our understandings of geopolitical assemblages and their (in)stability over time. Connolly (2010: 157) argues that this understanding can be cultivated; referencing the aforementioned 2003 invasion of Iraq, he notes that:

> many thoughtful people brought experience and sensitivity to bear on the situation before the invasion, reading signs, gauging potentialities in a volatile situation, sensing how immense the suffering could be, and how difficult it would be to change course once an invasion was launched ... They had a sense of the human predicament and the dangers of overreaching, and also understood how inaction is not a real possibility at pivotal moments. They poured a degree of modesty into those models of the masterful political agent, the consummate market, and warriors of unlimited military prowess. (Connolly, 2010: 157)

In a sense, these 'seers' (Connolly's term) are open to the potentialities found in any moment; they effectively intuit the possibility space from the affective relations in which they are participating.

Possibility spaces are abstract topological spaces existing in multiple dimensions. Each dimension is an axis on which the assemblage can vary, reflecting the various capacities of its component parts or of neighboring assemblages. Possibility spaces are structured by the ways in which properties of components or assemblages *tend* to interact. In these spaces, singularities emerge as points which tend to actualize more often. The degree to which the assemblage, as actualized in any given place or time, is near to these attractors indicates how territorialized the assemblage is, how coherent and stable it appears to us. The ability to vary many of these dimensions and still produce a similar assemblage

gives the impression of permanence; borrowing from ecological theory, this characteristic has been referred to as 'resilience' and imported into the social sciences (Walker and Cooper, 2011; Welsh, 2013).

If there are multiple attractors near one another, we grow accustomed to thinking of the assemblage as having multiple states of being (Jones, 2009). An example from the physical sciences is phase change; water can take liquid, solid, or gaseous forms simply by changing the amount of energy in the assemblage. In geopolitics, we might think of a multiparty democracy (party 1/party 2/party 3), the global economy (steady growth/boom/recession), and an individual's affective state (fearful/resentful/generous/ etc.) as having this kind of possibility space. In contrast, a possibility space with a single attractor will seem to have only one general state, but has nowhere to go should the outcomes of interactions vary widely from the norm. In this case the assemblage might either dissipate entirely or will appear to do so before reterritorializing around a new attractor. A geopolitical example might be the state ideal. Murphy (1996), among others, has noted the emergence and dominance of the state as a form of political organization. Even in periods of extreme pressure on political organization, recent examples such as the disintegration of Yugoslavia and the collapse of the Somali state point to dissipation followed by the reterritorialization of new state assemblages that are distinct from their antecedents but still huddle around that attractor in topological space. As Jeffrey (2013) notes, the state is a seductive idea that continually relies on the improvised performance of various actors to provide an illusion of coherence that stretches across these moments of rupture.

More conventionally, we can imagine the 'tipping point' between attractors as a threshold which can cause the entire assemblage to reorder itself, should enough outliers fall on the far side of it. We can see this in natural selection, when a new species breaks away from the old.

If it seems dangerous to be citing Darwin in a paper on geopolitics, it need not. This is not an argument for the survival of the fittest, which assumes a system at equilibrium in which the fittest emerges. Rather, it is a case of understanding individual assemblages as historical in nature, shaped by past experiences but always vulnerable to crisis. Resilience, like a component's capabilities, can only be understood in relation to a particular event. The biosphere of the dinosaurs was radically transformed not because the dinosaurs were not fit, but because an event literally impacted their ecological assemblage. Here the non-human agency of the asteroid pushed the system over a threshold into a new basin of attraction. The lesson for geopolitics is a simple one: assemblages appear stable and coherent until they no longer do. Just as few predicted the fall of the Soviet Union or the 11 September 2001 attacks (Cudworth and Hobden, 2011), complex systems are prone to non-linear outcomes. The emergent effects of the assemblage are too complex and excessive to predict (although social science has often staked its reputation on its ability to unpick this 'mess' – see Law, 2004). I now turn to a final geopolitical topic to which complexity theory speaks: the subject.

IV Bodies politic and the subject of geopolitics

Given the historical tendency of geopolitics to emphasize macro-scale phenomena, and its relatively recent attempt to engage with micro-scale phenomena (Dittmer and Gray, 2010), theories of the subject have not been at the forefront of geopolitical scholarship. However, complexity theory raises questions about the subject to which geopolitics is well positioned to contribute. Protevi (2009: 33) defines subjectivity through his concept of 'bodies politic': 'meant to capture the emergent – that is, the embodied and embedded – character of subjectivity: the production, bypassing, and surpassing of subjectivity in the

imbrications of somatic and social systems'. Bodies politic are always the layered, emergent product of assemblage, and therefore the perpetually changing intersection of multiple temporalities – the sensibilities derived from human evolution, the past experiences of the individuated body, and the near-simultaneous affects and discourses of the immediate moment (Connolly, 2002). Bodies politic engage in political cognition, which is when they engage in political evaluation of their situation from the perspective of certain racial, class-based, ethnic, national, and gender identities, as produced by now well-documented processes of subjectification (Foucault, 1977). Critical geopolitics has done an excellent job of documenting the role of academics, statespersons, and producers of popular culture in disseminating narratives that produce geopolitical subject positions (Dittmer, 2013; Dodds, 1994; Ingram, 2001; Kuus, 2011; Müller, 2011; Sharp, 2000). What it has not been very good at is tying these subject positions, and the political cognition that they enable, to political affect:

> The affective response patterns of bodies politic, which are triggered by sensation and play a key role in on-the-spot political cognition, are conditioned by our moods and personalities, which are themselves formed by the repetition of episodes of affective cognition. (Protevi, 2009: 35)

These political affects shape our reaction to events, but equally as reflexive agents we can work on changing our reactions, what Connolly (2002) refers to as micropolitics.

Importantly, Protevi goes beyond individual (or first-order) bodies politic to imagine second-order bodies politic, or assemblages that incorporate multiple human bodies (and non-human elements) in a political community, which can exist over a range of different temporalities: for example, the very short-term 'conversation', the relatively short-term 'protest group', or the relatively long-term 'nation' (see also Shaw, 2012).

A second-order body politic has a physiology, as it regulates material flows (1) among its members … and (2) between itself (its soma as marked by its functional border) and its milieu … This regulation of group system dynamics can be seen as construction of a virtual repertoire, modeled as the production of an attractor layout and affectively experienced as the background affect or mood of the group. A second-order body politic can also be studied psychologically, as it regulates intersomatic affective cognition, the emotional and meaningful interchanges (1) among its members and (2) between their collective affective cognition and that of other bodies politic, at either personal, group, or civic compositional scales. In other words, groups have characteristic ways – a limited virtual repertoire – of making sense of what happens, on the basis of which decisions take place as actualizations or selections from that repertoire. (Protevi, 2009: 38–39)

As constituent parts of these second-order bodies politic, individuals typically have little control over the collective's action, but the collective's action owes something to the agency of the first-order bodies politic composing it (Davies, 2012). Further, the emergent effect of the interactions among the first-order bodies politic (and other non-human components) can be a collective subject. Geopolitically, we might think of examples such as a military unit, united through embodied routines and affects, surmounting problems for which it may not have prepared. We might also consider moments when the assemblage of a body politic (whether first- or second-order) is pushed far from its normal attractor in possibility space, causing the emergent subject to drop out temporarily until intensities within the assemblage can return to normal. For an individual, this might mean flying into a rage and committing a crime of passion which the subject cannot later recall committing. For a group gathered in protest, this might mean a blind panic in which the group flees a threat without regard for those being trampled. These

withdrawals of subjectivity result in pure embodied affect without political cognition.

By considering our own subjectivity as not only the emergent outcome of our own cognitive and affective interactions, but also as distributed among the various bodies politic in which we participate, it becomes possible to imagine a multiplicity of agencies through which we work but which also work through us. To take the example of the panicked mob, it may not be that an individual within the mob has lost her or his subjectivity, but if the larger body politic has panicked, that panic will work in and through the individual's body as the individual is swept along. In a more explicitly geopolitical context, we can see how, for example, the assemblage of the US state apparatus interminably headed towards war with Iraq in 2003, despite many individuals' rejection of the *casus belli* (Ó Tuathail, 2003a). Similarly, we can see how the emergence of drone technologies shapes the geopolitical assemblages in which they are embedded. By making geopolitical assemblages the subject of inquiry, whether they be individual bodies or large transnational coalitions of states, corporations, and other institutions, geopolitical scholars can deploy the concepts described above to trace not only the geopolitical becoming, but also the alternatives that are as yet virtual but are, in Thien's (2005) words, 'Almost'.

V Implications for a field in transition

Thinking through the implications of the approach to geopolitics that I have just outlined is not an easy task. On the one hand, an assemblage/complexity approach is capable of assimilating several strengths and research emphases currently occupying critical geopolitics. For instance, work in critical geopolitics that emphasizes representation and narrative can be understood in terms of the (de)territorialization and

(de)coding of assemblages. This entails an ontological shift for some scholars who considered themselves ardent constructivists, but it is a shift that maintains a substantial role for discourse in geopolitics. Part of this critical realist commitment to materiality (i.e. there is a posthuman reality unfolding, even if we lack the ability objectively to know and represent it) enables greater attention to embodiment, performance, and affect than has heretofore been popular in critical geopolitics (excepting, of course, work in feminist geopolitics). Therefore, assemblage/complexity theory offers a way to integrate a wide range of tensions already extant within the critical geopolitical project. But it does more than that. In a world negotiating geopolitical challenges linked to disease (Ingram, 2008), disaster (Le Billon and Waizenegger, 2007), climate change (Dittmer et al., 2011), and shifts in the broader biosphere (Dalby, 2007), increasingly attention to the biological/environmental/material is a prerequisite for engagement on issues of the day. So how are these engagements to unfold?

In the remainder of this concluding section I would like to raise, and certainly not conclusively answer, two issues related to conducting geopolitical scholarship in this vein. The first issue related to geopolitics of assemblage is methodological. How to study assemblages? While the flat ontology of assemblages provides many entry points to a given assemblage, it can be difficult to make sense of the myriad interactions that produce it, especially given the differences in scale and temporality that characterize the various components and interactions (see Robbins and Marks, 2009). Further, given the nature of assemblages as open systems that are always in flux, with components adding in or dropping out over time, it can feel impossible to know when to stop tracing interactions. These are challenges to be met. Yet there are advantages to be reaped. Anderson and McFarlane argue that assemblage:

> suggests a certain ethos of engagement with the world, one that experiments with methodological

and presentational practices in order to attend to a lively world of differences ... Montage, performative methods, thick description, stories – all have been used by geographers and others in an attempt to be alert to processes of [assemblage]. (Anderson and McFarlane, 2011: 126)

With this ethos in mind, geopolitics can itself be opened up to a range of new methods, as well as new ways of presenting work derived from methods used in the past. Leaving aside the proliferation of computer-based models and simulations that dominates certain fields addressing complexity (DeLanda, 2011; Manson and O'Sullivan, 2006), one particular way forward might seem surprisingly retro-chic: historical analysis (Cudworth and Hobden, 2011). This is not simply a call for a return to historical description, but rather a return to the archive with new objects of study and new interpretive resources. Recalling that each assemblage has its own particular historical trajectory, with regard to both its own composition and emergence and its interactions with other assemblages, it becomes crucial to investigate the particularities of each, to understand both patterns that might be replicated through populations of assemblages and the mutant outlier outcomes that might likewise reappear in other places and times. Such investigations can strive to understand the virtual forms that the assemblage could have taken but which were never actualized (Day, 2010; Warf, 2002). In short, historical analysis can enable a tracing of the possibility spaces of contemporary assemblages. Excavation of these lines of flight can help us to undermine the seeming reality of 'path dependence' in the present. Such an historical approach could be usefully married to more contemporary research methods, such as ethnography, interviews, and performative research, in order to inspire these connections between the past and the present.

The second of these issues relates to the ethics of the posthuman and relational ontology which I have traced, and their implications for

geopolitical scholarship. Bennett (2010) argues that incumbent on those engaging with the posthuman is the necessity to cultivate our perception of non-human agency. This claim dovetails with Connolly's appreciation for 'seers', those who can tap into virtuality in order to perceive, however dimly, the shape of possibility spaces. Cultivating these sensibilities among scholars is not only an ethical imperative, an element of the micropolitics that Connolly advocates elsewhere (2002), but it also lays out a line of flight – a research agenda if you will.

This is more than a reiteration of the assumptions of posthumanism. Rather, by making a break with the exclusive hold of humanity on political agency, we open ourselves up to agencies unlinked to an intentional subject. Here it is worth connecting Protevi's concept of bodies politic with Spinoza's onto-ethical maxim:

> When a number of bodies of the same or of different magnitudes are constrained by others in such a way that they are in reciprocal contact with each other, or if they are moved with the same or different degrees of speed in such a way that they communicate their motions to each other in some fixed ratio, we shall say that those bodies are reciprocally united to each other. We shall also say that all such bodies simultaneously compose one body, i.e. an individual, which is distinguished from others by this union of bodies. (Spinoza, 2000 [1677]: 128, cited in Woodward et al., 2010: 273)

The possibility of emergent agencies beyond the anthropocentric notion of politics with which we have worked with for so long begs the question of ethical responsibility, not only for our individual roles within them, but for our relations with them (Connolly, 2013). In a world with distributed agency, how much responsibility can we *take*? And, possibly, how can we take *more*? All of this calls into question the humanist impulse of recent key normative stances in critical and feminist geopolitics (Hyndman, 2010; Megoran, 2008; see also Dalby, 2007). In order to wrestle with

the ethical implications, however, it is first incumbent on us to trace these geopolitical assemblages so that we can begin to understand our roles in a more-than-human world.

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