



Preemption, precaution, preparedness: Anticipatory action and future geographies

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Abstract

The paper focuses on how futures are anticipated and acted on in relation to a set of events that are taken to threaten liberal democracies. Across different domains of life the future is now problematized as a disruption, a surprise. This problematization of the future as indeterminate or uncertain has been met with an extraordinary proliferation of anticipatory action. The paper argues that anticipatory action works through the assembling of: styles through which the form of the future is disclosed and related to; practices that render specific futures present; and logics through which anticipatory action is legitimized, guided and enacted.

Keywords

anticipation, events, future, precaution, preemption, preparedness

I The presence of the future

In this paper I aim to open up a set of questions for research in human geography on preemption, preparedness and other forms of ‘anticipatory action’. I argue that anticipatory action matters because geographies are made and lived in the name of preempting, preparing for, or preventing threats to liberal-democratic life.¹ Consider just a few high-profile examples that are likely to be familiar to readers of this journal. Ruined landscapes of damage and destruction have been generated in Iraq, Afghanistan and elsewhere in the name of preempting the threat of terror (Gregory, 2004). In order to prepare for avian flu, western states have acted extraterritorially through the culling of bird populations (Braun, 2007). A set of mitigation policies based on global carbon trading are being rolled out as precautionary measures to combat the threat of climate change (Bumpus and Liverman, 2008).

In relation to terrorism, climate change and trans-species epidemics, acting in advance of the future is an integral, yet taken-for-granted, part of liberal-democratic life. In the above examples, bombs are dropped, birds are tracked, and carbon is traded on the basis of what has not and may never happen: the future.

How, then, to respond – analytically, methodologically, politically – to the making of geographies through anticipatory action? My starting point is that preemption, preparedness and precaution pose a problem to some of human geography’s most ingrained habits and techniques of thinking. Anticipatory action perplexes us, or at least it should, because it invites us to

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think about how human geography engages with the taken-for-granted category of ‘the future’. Common to all forms of anticipatory action is a seemingly paradoxical process whereby a future becomes cause and justification for some form of action in the here and now. This raises some questions: how is ‘the future’ being related to, how are futures known and rendered actionable to thereafter be acted upon, and what political and ethical consequences follow from acting in the present on the basis of the future? Addressing these questions requires that we explicitly conceptualize the relation between space-time and futurity. However, with some notable exceptions, including work on figuring futures (Kitchin and Kneale, 2002; Pinder, 2005) and experiencing futures (Anderson, 2006b; Kraftl, 2007), human geography has rarely explicitly engaged with the category of the future (compare with the vast amount of work on the past, memory and haunting; Pile, 2005; Wylie, 2007; Adey and Madder, 2008). This is not to say that the future is absent. On the contrary, we find hints of the complicated interrelations between past, present and future across a range of work. Consider, as just one example, the anticipatory-utopian orientation to better futures that animates calls for more just (Smith, 2000), participatory (Kinpaishy, 2008), postcapitalist (Harvey, 2000) or sustainable (Wolch, 2007) geographies. In the enactment of better worlds, the future is constantly being folded into the here and now; a desired future may act as a spur to action in the present, for example, or action in the present may bring back memories of long-forgotten hoped-for futures. Nevertheless, with a small number of exceptions, most notably Massey’s (2005) attempts to craft a spatial vocabulary sensitive to the event of co-existence, human geography has not explicitly engaged with questions of how the future relates to the past and present. The risk is that we repeat a series of assumptions about linear temporality; specifically, that the future is a blank separate from the present or that the future is a telos towards which the present is heading.

More specifically, to understand how anticipatory action functions we must understand the *presence* of the future, that is the ontological and epistemological status of ‘what has not and may never happen’ (Massumi, 2007). While I will clarify the notion of the presence of the future below, it is worth noting that the problem of how to understand the presence of the future is not unique to anticipatory action. A list of just some ‘future geographies’ gives us a sense of the sheer variety of ways in which futures may be related to. Futures are: traded in futures markets, promised in contracts, expected in the form of profit, created by birth, commodified by finance capital, invested in by savers animated by a Calvinist work ethic, divined by fortune tellers, coaxed into being by theorists of diverse economies, projected by certain utopians, deterred by nation states, regularized through clock time, prophesied by evangelicals, expressed through everyday hopes, and imagined by readers of science fiction, to name only some relations (see Adam and Groves, 2008). What this list opens up is a task beyond the emphasis in this paper on anticipatory action: to understand how geographies are lived and made as futures are prophesied, imagined, deterred, regularized, invested in, hoped for and so on.

In this paper I offer a conceptual vocabulary to address this task. It sits in the juncture between a Foucaultian analytic of how futures are now governed (Dillon, 2007; Amoore, 2007; de Goede, 2008a) and the emphasis in non-representational theories on the presence of the future (Anderson, 2006a; Thrift, 2007; Kraftl, 2007). Specifically, I argue that futures are anticipated and acted on through the assembling of:

- *Styles*, consisting of a series of statements through which ‘the future’ as an abstract category is disclosed and related to. Statements about the future condition and limit how ‘the future’ can be intervened on. They function through a circularity, in that

statements disclose a set of relations between past, present and future *and* self-authenticate those relations.

- *Practices* that give content to specific futures, including acts of performing, calculating and imagining. It is through these acts that futures are made present in affects, epistemic objects and materialities.
- *Logics* through which action in the present is enacted. A logic is a programmatic way of formalizing, justifying and deploying action in the here and now. Logics involve action that aims to prevent, mitigate, adapt to, prepare for or preempt specific futures.

When taken together, the conceptual vocabulary enables a mode of inquiry that aims to understand the multiform presence of the future in any and all geographies. By this I mean that inquiry would attend to how futures are: disclosed and related to through statements about the future; rendered present through materialities, epistemic objects and affects; and acted on through specific policies and programmes.

The paper proceeds as follows. In section II, I place the proliferation of anticipatory action in the context of a spatial-temporal imaginary of life as contingency. The rest of the paper differentiates between the different practices and logics that respond to this problematization of the future. My formalization of practices/logics is designed to open up a set of questions about how anticipatory action operates, rather than broader issues of the processes and structures through which life is governed. In section III, I describe three modes of practice through which futures are made present: calculation, imagination and performance. Section IV then moves on to describe three logics – precaution, preemption and preparedness – through which futures are acted on. Each section includes a short example. These are designed to draw out some of the differences between the practices and logics. In the conclusion, I discuss two wider implications that a study of anticipatory action could have for

social/spatial theory; these revolve around thinking about both the presence of ‘what has not and may never happen’ and how we relate to futurity.

II Anticipatory action and ‘the future’

The types of anticipatory action that are the focus of this paper – preemption, precaution and preparedness – have been deployed in liberal democracies to govern a range of events, conditions and crises (see Zedner, 2007, on pre-crime; Anderson, 2007, on new technologies; or Evans and Colls, 2009, and Evans, 2010, on public health). However, it is primarily in response to three high-profile threats to liberal-democratic life that anticipatory action has been formalized and legitimized: conventional, bio, nuclear and chemical terrorism post 9/11 in relation to national and domestic security (Massumi, 2007; Dillon and Lobo-Guerrero, 2008; Amoore and de Goede, 2008); the advent of human/non-human infectious diseases and transgenic pandemics (such as swine flu or SARS) in the context of biosecurity (Cooper, 2007; Braun, 2007; Hinchliffe and Bingham, 2008; Donaldson, 2008); and abrupt ecological disaster and destruction in the context of global warming and ozone depletion (Cooper, 2007; Hulme, 2008). Although they may appear to pertain to different domains of life, there are a number of commonalities in how terrorism, trans-species epidemics and climate change have been enacted as threats. First, in comparison to systemic interruptions, ruptures and breakdowns, they are potentially catastrophic. That is, each threat may irreversibly alter the conditions of life at both the microscopic and pandemic levels (Hannah, 2006; Cooper, 2007). Second, in each the ‘malicious demon’ (Ewald, 2002) that is heralded as the source of disaster is a somewhat vague spectral presence that cannot easily be discerned (Swyngedouw, 2007; Aradau and Van Munster, 2007). Third, in each the disaster is imminent (Cooper, 2007).

Not only is the present on the verge of disaster, but disaster is incubating within the present and can be discerned through ‘early warnings’ of danger (whether through the ‘harbingers’² of climate change or ‘radicalization’ in anti-terror legislation; UK Government, 2009). Without some form of action, a threshold will be crossed and a disastrous future will come about (Ophir, 2007). However, because the disaster is incubating within the present, life will remain tensed on the threshold of disaster even if an immediate threat is acted against. Anticipatory action must, therefore, become a permanent part of liberal democracies if disaster is to be averted.

The problem that climate change, terrorism and trans-species epidemics pose for efforts to protect certain forms of valued life revolve around the future: how to act in the here and now before the full occurrence of a threat or danger? This problem opens up a question: how does the future relate to past and present? Every attempt to stop or mitigate a threat holds certain assumptions about ‘the future’. It is worth recalling just a few other ways of acting on the future in order to be specific about how ‘the future’ is related to in contemporary anticipatory action: for example, the future as an imminent/transcendent End of the World was central to the authority of monotheism (Blumenberg, 1985); the future as indefinite, open and perfectible enabled accounts of progress (Luhmann, 1993); while, finally but not exhaustively, the future as a mystery underpins forms of iconoclastic utopianism (Jameson, 2005). Each of these different types of action is accompanied by a series of statements about how ‘the future’ relates to the past and present. Of course, much more needs to be said about differences in how ‘the future’ is figured. For the purposes of this paper, all I want to stress is that statements problematize³ ‘the future’ in particular ways, conditioning how it may be anticipated and acted on.

Integral to contemporary anticipatory action is one such problematization of ‘the future’: the assumption is that the future will diverge from

the past and present. It is neither a perpetuation of the present, nor an imminent-transcendent End outside of time. Instead, the future will radically differ from the here and now (even as the here and now or the past may contain traces of the disaster to come). As a range of work in geography and elsewhere demonstrates, the language of ‘uncertainty’ and ‘indeterminacy’ can now be found throughout attempts to govern climate change, terror and trans-species epidemics (Dillon and Lobo-Guerreo, 2008; Diprose *et al.*, 2008; Amooore and de Goede, 2008; Adey, 2009). On the one hand, the future will be uncertain in the sense that it will exceed present knowledge (or the capability to generate knowledge). On the other hand, the future will be indeterminate in that perfect knowledge is impossible. The future is the realm of troubling and unforeseen novelty. It will be qualitatively different from the past and present and may bring forth bad surprises. Contingency, discontinuity and shock are just some of the names used to evoke the openness of such a future (Hacking, 1976; Dillon and Reid, 2009).

Of course, how to act under conditions of indeterminacy and uncertainty is not a new problem – far from it. As Foucault and others teach us, the problem of how to seize possession of an uncertain future has reverberated across various modalities of liberal government and rule (Rose, 1999; Foucault, 2007; 2008). The context to this paper is, more specifically, that anticipatory action is now imbricated with the plurality of power relations that make up contemporary liberal democracies (Dean, 2007). This means that any type of anticipatory action will only provide relief, or promise to provide relief, to a valued life, not necessarily all of life. Certain lives may have to be abandoned, damaged or destroyed in order to protect, save or care for life. More specifically, the proliferation of anticipatory action, and the emphasis on an open future, is inseparable from a spatial-temporal imaginary of life as contingency (Dillon, 2007). Three elements in this imaginary are

particularly important, and tie the deployment of anticipatory action into a set of broader social-spatial conditions.

First, the life threatened is understood in terms of its irreducible complexity (Dillon, 2003), complexity being a function of a globalized world of transnational flows and connections. The emphasis is on the ceaseless associating of diverse, heterogeneous, elements (Dillon and Lobo-Guerrero, 2008). The figure of the network has become the main way of describing this spatial form (Galloway and Thacker, 2007). But the change has also been named in now familiar meta concepts such as time-space compression and the earlier term time-space convergence. Climate change, terrorism and trans-species epidemics have all, therefore, been governed around the problem of the relation between 'good' and 'bad' circulations and connections. Respectively, the transnational terrorist is sustained and enabled by 'non-normal' flows of money and people (Feldman, 2006). Replicating, mutating, viruses emerge from animal movements, air travel and an intensified agri-food system (Keil and Ali, 2006). Global warming is emergent from the surpluses of carbon that sustain the circulation of people, things and information (Cooper, 2004). The future is open, first, because threats emerge from a complex world of flows and connections.

Second, the problem is the heterogenesis of the bad within the good. The future is open for a second reason: life is imagined as unpredictable, dynamic and non-linear (Cooper, 2006). Change cannot be understood as the linear outcome of past conditions or present trends. In each case events are themselves complex, singular, occurrences that are not necessarily temporally bound by start, middle and end, or spatially bound in a given national territory (Beck, 1992; Erikson, 1994). It is, therefore, necessary to act on catastrophic processes as or before they incubate, and certainly before they cross a threshold to become catastrophic events (Ophir, 2007). In addition, the causes of disaster are presumed to incubate within life. They are

not mysterious, external, acts of God visited upon that life. The result is that the life to be cared for is equivalent to the life that must be acted over. How, then, to anticipate the occurrence of a terrorist event when spectral terrorists supposedly blend and blur with the population? How to anticipate the human effects of abrupt and extreme weather events such as melting ice sheets or thermohaline inversions against a backdrop of the complexities of climatic systems? How to anticipate the mutation of a strain of the H5N1 virus that is lethal to humans in the context of the spaces in which humans and birds meet and intermingle?

Third, events are 'de-bounding' in Beck's (1992) sense of the term, by which I mean that their effects are not necessarily localized spatially or temporally (Erikson, 1994). The impacts or consequences of a disaster will extend in non-linear ways across space-times. Again this is best put as a series of practical questions: how will the effects of an event of terror unfold in the hours, weeks and months after an attack as it disorders the circulations and interdependencies that make up life, how will avian flu spread and mutate in the context of mobilities, conditions of industrialized poultry farming, and the proximities of living in global cities, and how will climate change affect future generations a hundred years from now? The future is open, finally, because disasters are themselves emergent phenomena (Beck, 1992). That is, the effects or impacts of disaster change as they circulate.

Although not the purpose of this paper, it is possible to articulate a series of wider conditions for this equation between life and contingency, in particular: mutations in advanced capitalism based on finance capital, contemporary globalization and the extension of various transnational mobilities, and the emergence of new forms of transnational agreement and cooperation in systems of governance.⁴ While offering this type of meta account is alluring, I am wary of drawing too tight a correspondence between a set of wider social-spatial conditions and changes in

the form of 'the future'. The danger is that the latter are made into a secondary phenomenon to be explained away by the former. What I want to emphasize is more modest: anticipatory action has emerged in a situation where it is precisely the contingency of life that is the occasion of threat and opportunity, danger and profit. Preemption, preparedness and precaution are, therefore, caught in the productive/destructive relation with uncertainty that characterizes liberalism (Foucault, 2008). On the one hand, life must be constantly secured in relation to the dangers that lurk within it and loom over it. Life is tensed on verge of a catastrophe that may emerge in unexpected and unanticipated ways. On the other hand, the securing of life must not be antithetical to the positive development of a creative relation with uncertainty. Liberal life must be open to the unanticipated if freedoms of commerce and self-fashioning individuals are to be enabled. Uncertainty is both threat and promise: both that which must be secured against and that which must be enabled.

In this context the pragmatic question for anticipatory action becomes: how to act in a way that protects and enhances some form of valued life? The response has been to govern and secure on the basis of possible or potential futures that threaten some form of disruption to an existing social-spatial order. Unlike social movements that may welcome, enact and live radically different futures that genuinely surprise (Harvey, 2000; Pinder, 2005), anticipatory action aims to ensure that no bad surprises happen (Derrida, 2003). The result is that the here and now is continuously assayed for the futures that may be incubating within it and emerge out of it. Invoking the future as a surprise has been met, then, by different styles of disclosing and relating to 'the future' in relation to 'the present'. These are all bound up with the 'erosion of determination' (Hacking, 1990) in a world stripped of either the omnipotence of divine will or iron laws of determination. The links between two such styles, uncertainty and liberal rule are well known: first,

styles of foresight based on good judgement as a means of acting against Fortuna (Hacking, 1976); second, probabilistic prediction based on induction from the past distribution of events (Hacking, 1990).

A range of recent work has described how these two styles are in the midst of being supplemented by a third across efforts to govern terrorism (Clarke, 2005), abrupt climate change (Posner, 2004) and trans-species epidemics (Cooper, 2006). This is through the proliferation of possibilities about the occurrence and effects of events, alongside an attention to improbable but high-impact events. Here indeterminism is not only epistemic – that is, based on a restriction of knowledge that could in principle be overcome. Rather, it is an irreducible fact about a 'pluri-potential' (Connolly, 2008) world of complex interdependencies, circulations and events. Terms such as 'possibilistic' thinking (Clarke, 2005), 'as if' thinking (Furedi, 2007) and 'enactment' (Collier, 2008) have been used to name this emerging style. I find the term 'premediation' (Grusin, 2004) is most useful. Premediation names a set of statements that disclose and relate to 'the future' as a surprise. These statements shape how the future can be acted upon in two ways. First, disclosing the future as a surprise means that one cannot then predetermine the form of the future by offering a deterministic prediction. Instead, the future as surprise can only be rendered actionable by knowing a range of possible futures that may happen, including those that are improbable. Second, statements about the future as a surprise do not enable the future to be grasped and handled through a process of induction from the past distribution of events. Instead, anticipatory action must be based on a constant readiness to identify another possible way in which a radically different future may play out. Premediation is distinguished, therefore, from the statistical-archival styles of reasoning that enabled the development of modern ideas of risk (Collier, 2008). The emphasis shifts to knowing the future

directly because there could always be another radically different way in which events could evolve (Ewald, 2002).

Statements about ‘the future’ as a surprise underpin preemption, preparedness and other forms of contemporary anticipatory action. We shall see how in the following two sections. Before turning to the practices that make specific futures present (section III), and the logics that act in the here and now (section IV), it is worth stressing that the problem of an open future has a particular genealogy. A full account of this genealogy is beyond the scope of this paper but might, for example, begin with the ‘[s]ubstitutions, displacements, disguised conquests, and systematic reversals’ (Foucault, 1997a: 86) between (neo)liberalism, the general conditions named above and the long tradition of military thinking on surprise, the birth of cybernetics and the development of the complexity/chaos sciences, theories of natural selection that emphasize deviation and differentiation, the proliferation of imagination in the cold war in response to nuclear war, and the history of gambling and speculation in finance – to name just some events and processes through which the contingency of life and the openness of the future have been disclosed.

III Practices: Calculation, imagination, performance

How does contemporary anticipatory action function if life is understood in terms of contingency? To act before the disaster takes place, futures must somehow be known and made present. But relating to the future as a surprise that may bring forth unforeseen novelty rather than, say, a perpetuation of the present, might initially seem to lead to an impasse. For how to render futures actionable when the future cannot be known through the past frequency and severity of events? However, and contra to Beck’s (1992) thesis regarding the ‘incalculability’ of certain modern risks, a range of practices have been invented, formalized and deployed for knowing futures and therefore

attempting to ensure that there are no ‘bad surprises’ (Derrida, 2003).

I use the admittedly awkward phrase ‘the presence of the future’ throughout this section to emphasize that anticipatory practices do more than gather the knowledge necessary to know futures. They also enable the performative operation of establishing the *presence* of ‘what has not happened and may never happen’ (Massumi, 2007). The being-there of the future, or what Augustine termed the ‘time present of things future’,⁵ can be achieved through numerous forms. Futures are present through epistemic objects such as insights, trends, stories or models (Anderson, 2007; Adey, 2009), through materialities such as reports or images (Kraftl, 2005; Evans, 2010), and through anticipatory affects including fears, hopes and anxieties (Anderson, 2006a; Kraftl, 2007). This is, of course, not unique to attempts to govern terrorism, trans-species epidemics or global warming. In everyday life, ‘present futures’ and ‘future presents’ (Adam and Groves, 2008) are constantly embodied, experienced, told, narrated, imagined, performed, wished, planned, (day)dreamed, symbolized and sensed. Yet making a specific future present is a seemingly paradoxical operation because, as Massumi (2005a; 2005b) argues, it involves a passage between ontological modes. Any specific future – whether present in a climate change model or through a barely sensed apprehension about swine flu – is suspended between a here and now and an elsewhere or elsewhere. Futures are present as epistemic objects, affects or materialities. However, they do not cease to be, in some way, absent in that they have not and may never happen. My focus in the following subsections is on how futures are made present while remaining absent through practices of calculation, imagination and performance.

I Calculating futures

Indeterminate/uncertain futures have long been made present through the ubiquitous calculations

that form a constant background to life (Amoore and de Goede, 2008). Calculation occurs through a huge range of techniques: including threatprints, data mining, impact assessments, trend analysis, and complexity modelling of various forms (Bougen, 2004; Ericson, 2007; Amoore, 2008). What these diverse techniques share is that they take a measure of the world, by which I mean that statements about the indeterminacy of the future are combined with non-linear, or stochastic, calculations of relations, associations or links. The result is that specific futures are made present through the domain of number, numbers which are then visualized in forms of 'mechanical objectivity' such as tables, charts and graphs (Daston and Galison, 1992). As a mode of practice, calculation has long been central to ways of governing futures (through risk assessments and cost-benefit analysis) (Giddens, 1991; Luhmann, 1993; Reith, 2004).

Let us look briefly at the operation of calculation in the context of the equation between life and contingency by considering the use of 'catastrophe models'. 'Catastrophe models' are now used by the (re)insurance industry and policy-makers in relation to an ever growing set of 'low probability-high impact' perils, including hurricanes, flooding, infectious diseases and terrorism (Bougen, 2003; Ericson and Doyle, 2004). Consider the 'Infectious Disease Catastrophe Model' as used by Risk Management Solutions, one of the leading providers of catastrophe modelling. The model is used to estimate loss in the context of the contingency of the viral life of infectious diseases – events that 'cannot be easily predicted' (RMS, 2008: 3). A catastrophe model generates a stochastic event set of, approximately, 2000 possible pandemics. The possible geographies of the pandemics vary from one another on the basis of infectiousness and lethality of virus, spatial and temporal location of outbreak, pandemic lifecycle, and countermeasures. Each 'possible pandemic' is generated through standard metrics for counting and tracking the geographies of actually existing

pandemics. These include virology, epidemiology, case studies of past epidemics, and diagnostic pandemic surveillance data.

How, then, do calculative practices render an open future actionable? Catastrophe models quantify unpredictable disorder and disruption by generating *multiple* possible future pandemics; loss is then estimated through this set (Bougen, 2003). More precisely, the effects of future pandemics are made present through numbers (such as numbers of fatalities/injuries or graphs such as exceedence probability curves⁶) and in forms of mapping (such as global maps of pandemic spread, or timelines of a pandemic's phases). This leads to two effects, both common to calculation. First, a 'bond of uniformity' (Cohen, 1999) is imposed on the catastrophic event by drawing together a set of effects that vary spatially and temporally. Immediate loss of productivity is calculated alongside long-term loss of life, for example. Second, the future event is disentangled by sorting out and ranking the effects of the different elements within a pandemic. So results are presented in graphs showing how different virus characteristics would affect global pandemic spread, for example (RMS, 2008).

2 Imagining futures

The operations of creating a bond of uniformity, and disentangling an event, are common to how calculative practices render futures actionable. Calculation, whether through CAT models or other techniques, renders complex future geographies actionable through the numericalization of a reality to come – numbers that may thereafter circulate, be reflected on and take on an affective charge. Invoking the openness of the future has also been met with repeated calls to harness the powers of imagination (Salter, 2008). The second way of making futures present is through practices based on acts of creative fabulation, including techniques such as visioning, future-basing, link analysis and scenario

planning (Ericson and Doyle, 2004; Lobo-Guerrero, 2007; Anderson, 2007; Salter, 2008). These involve a transmutation of the 'here and now' through what Casey (1976: 115) terms an 'as if' *thetic*⁷ process. Future events, states of affairs, or persons are imagined 'as if' they were actual or real. The outcomes of processes of imagination differ from forms of mechanical objectivity; they range from forms of visualization (such as images, symbols and metaphors) to forms of narrativization (such as stories). Making the future present becomes a question of creating affectively imbued representations that move and mobilize.

Consider one example of the deployment of practices of imagination: a set of scenarios on the future of 'intelligent infrastructures' in the context of the uncertain effects of climate change. Before doing so, it is worth noting that there is now a wide range of affectively imbued popular imaginations of apocalyptic climate change futures, often involving evocative images of melting ice or charismatic species (Boykoff, 2008). In addition, as Hulme and Dessai (2008a; 2008b) show, 'climate change scenarios' and 'climate scenarios' function as 'predictive judgements' across the climate change field. 'Intelligent infrastructures' was one of a number of programmes of work on 'futures' that have been undertaken by the UK Foresight directorate.⁸ The focus was on how adaptive 'intelligence' can be designed into the UK's physical infrastructures in the context of climate change. The report was organized around four scenarios: 'perpetual motion', 'urban colonies', 'tribal trading' and 'good intentions'. Each imagined a post climate change future. 'Tribal trading', to give one example, begins after a series of extreme climatic events and imagines a world of empty cities and clustered rural communities. As with the other scenarios, a set of possible (rather than probable) 'as if' geographies are made present through forms of visualization and narrativization. Each scenario begins with an 'artist's impression' of how the scenario would

look and feel. It then contains a linear dateline from 2005 to 2055 that offers a 'future history' that would lead up to the scenario, before a more detailed narrative. Interspersed with this narrative are short stories describing how individuals inhabit the imaginary world.

We can see from this brief summary that practices that harness imagination make the future present in ways that are quite different from calculation. In the above case, climate change futures are present through pictures, stories and case studies. Because of the openness of the future, and the impossibility of predetermining the future, the report contains a series of warnings against the use of any one of the scenarios to predict. The scenarios should, instead, be used alongside one another '[t]o stimulate thought, to highlight some of the opportunities and threats we might face in the future and to inform today's decisions' (UK Foresight, 2006: 7). As a means of knowing futures that 'could' or 'might' happen, the scenarios render the future geographies of infrastructure actionable through two effects. First, a horizon of expectation is created that is composed of a set of hypothetical possibilities that the scenarios refer to. The scenarios organize and categorize while affirming the openness of the future. Second, the scenarios evoke without predicting the suspension, and disruption, of life that may follow climatic change. The scenarios subsequently had a pragmatic value within efforts to mitigate the impacts of climate change on UK life and to design 'intelligent infrastructures'. They are rationalized by the Foresight Directorate as a means to 'stimulate' thought and 'highlight' opportunities and threats. The scenarios provide, we could say, a tool to think with and thereafter strategically intervene on the future (Anderson, 2007). So the above scenarios were used as part of a year-long programme of dissemination, including various 'stakeholder workshops' comprising representatives from businesses involved in retail and logistics. Making the future present through imagination provides, in this case, a formulaic

set-up for exploring the diffuse ‘impacts’ of climate change across various circulations and interdependencies.

3 Performing futures

Futures are also made present through practices that stage an interval between the here and now and a specific future through some form of acting, role play, gaming or pretending. These are linked to imagination but use the creative capacities of embodiment more explicitly. Practices based on performance include a series of techniques that have their origins in the realms of theatre, drama and play, most notably exercises (Anderson, 2010), war games (Der Derian, 2001) and simulations (Budd and Adey, 2009). They have multiple functions, normally in the context of situations of uncertainty regarding how events will unfold. These include generating knowledge of a future event when historical evidence is lacking and producing capacities that enable predictable response. Although ways of performing futures differ substantially, most involve staging a specific possible future (whether in live or artificial time), and participants then playing or performing a set of roles. Here the future is made present and rendered actionable in a third way: ‘as if’ futures are created through the ‘anticipatory experience’ generated through both the acts of performance or play and the material organization of particular stages or sites (Davis, 2007; Anderson, 2010).

Let us briefly consider one example to differentiate performance from imagination and calculation: a tabletop exercise named ‘Dark Winter’ that was held in the USA on 22–23 June 2001 and focused on a bioterrorist attack (see O’Toole *et al.*, 2002). The decision-making exercise was based on a simulated national security crisis caused by a simultaneous smallpox release in three separate shopping malls in Oklahoma City, Philadelphia and Atlanta. What the exercise simulated was a series of decision-making challenges as the future event

multiplied into a crisis by disordering the flows and connections of urban life. Key was smallpox transmission, a circulation described by the exercise designers in ways that reminds us again of the problem of life as contingency: ‘[a] complex, dynamic, fluctuating phenomenon contingent on multiple biological (both host and microbial), social, demographic, political, and economic factors’ (O’Toole *et al.*, 2002: 974). The table-top exercises began after the advent of the event and involved a number of distinct forms of ‘as if’ embodied action (see Schoch-Spana, 2004). Twelve senior former officials pretended to be members of the National Security Council, while five journalists from CBS, the BBC and other news organizations participated in a mock press conference during the exercise. Through the combination of these and other forms of ‘as if’ action, the future event of a bioterrorist attack is made present through the body. As well as being present as number, or in forms of narrativization or visualization, the future is embodied in the stress, excitement or boredom of the exercise play. Lakoff (2008) shows how the anticipatory experience of the exercise had two effects within US bio-defence. First, the exercise generated experiential knowledge of vulnerabilities to the object secured (vital systems). It was this experiential knowledge – surprise and horror at the lack of preparedness – which was testified to in senate and house hearings around bioterrorism. Second, and closely related, the exercise directed attention to bioterrorism, generated a sense of urgency, and galvanized action to improve preparedness. In short, it is by making futures present experientially that techniques of performance function. The space of the exercise becomes an occasion for experiencing how a future event might feel.

This is the barest sketch of three modes of practice. Calculation, imagination and performance enable specific futures to be made present while remaining absent, whether through a graph of

Table 1. Anticipatory practices

	Calculating futures	Imagining futures	Performing futures
Way of making future present	Enumerating possible futures	Representing a set of plausible futures	Embodying an 'as if' future
Evidence	Extrapolation based on some form of enumeration	Collective tacit and codified knowledge of participants	Bodily experience of participants
Acts	Counting, inferring, judging	Imagining, representing, narrating	Playing, pretending, acting
Inscription	Trend, graph, model	Vision, story, forecast, scenario	Insight, lesson learnt, anticipatory experience
Paradigmatic techniques	Trend analysis, modelling, data mining	Scenario planning, foresight, backcasting, envisioning	Exercises, war games, strategic games, simulations

future losses, a story of a journey or a feeling of shock. For heuristic purposes, and to risk an overformalization of differences between practices, Table 1 provides a summary of each mode of practice.

As hinted above, the techniques linked to each practice – catastrophe models, exercises and so on – have all been invented and formalized in particular contexts. Scenarios, for example, were first named as a technique by RAND researchers in the cold war (Ghamari-Tabrizi, 2005; see also Kahn, 1962). But an account of their development would have to stretch back into a history of the stage in theatre, and through into the use of scenarios by Shell in the 1970s and commercial consultants. In addition to a genealogy of different techniques, a set of questions opens up about how the presence of specific futures may intensify, fade, blur, be repressed, or otherwise change.

First, how are the affects, epistemic objects and materialities through which futures come to be present produced? How, for example, is a 'worst case' scenario written and illustrated, or an exercise planned and designed? Such a focus on the minutiae of anticipatory practices in action (to paraphrase Latour, 1987) would require understanding the acts of thinking and doing that surround different practices (such as brainstorming, designing, etc). It would also involve placing

each practice within the organizations, epistemic communities and communities of practice who use different anticipatory techniques (after Amin and Cohendet, 2004). The political questions which follow would focus on the forms of authority and expertise that enable certain futures to appear, gain and retain presence. Second, a geography of futures in action would attend to how affects, materialities and epistemic objects circulate within networks of governance, change as they are encountered, and get incorporated into anticipatory action (or calls for action). Here the key political question is around how the experience of the presence of certain futures is used to demand, justify and legitimate certain forms of action to secure life (including inaction). Of course, making a future present – even creating an intensified presence – does not necessarily mean it becomes a 'future cause' (Massumi, 2007) of action. We know this well from debates about, for example, the contested relation between apocalyptic constructions of climate change futures, the affects of apathy and depoliticization (Hulme, 2008).

IV Logics: Precaution, preemption, preparedness

Styles and practices enable open futures to be rendered actionable. They are, therefore, a

necessary component of anticipatory action. In this section I move to the third and final component of my analytics of anticipatory action in liberal democracies: logics. By logic I mean a coherent way in which intervention in the here and now on the basis of the future is legitimized, guided and enacted. I focus on three – precaution, preemption and preparedness – although we should note others such as deterrence, foresight in contract or tort law, and social and actuarial insurance. The goal of each is to care for a valued life by neutralizing threats to that life. Engagement with their deployment must not, therefore, rest on a facile denunciation of any action that inhabits the cusp between present and future. Neither should it rest on a barely articulated normative criterion that anticipatory action inevitably reduces, somehow, the mystery of life and openness of the future. For, as we have seen, anticipatory action is based on a presumption that life is contingency and that the future will remain an open horizon, even as attempts are made to ensure that there are never any bad surprises (Derrida, 2003). Instead, critical engagement must turn on questions of what life is to be protected or saved, by whom, and with what effects. And, conversely, what life has been abandoned or destroyed, by whom, and with what effects.

The most common qualification of preemption, preparedness and precaution is as ‘doctrines’ (as in the doctrine of preemption) or ‘principles’ (as in the precautionary principle). These terms give the sense that they are a means of guiding proper action that exceed any instance of their actual use (as do the terms ‘philosophy’ and ‘paradigm’ – as used by Ewald, 2002). I want to retain this sense of autonomy and mobility as it reminds us that each logic can be found across terrorism, climate change and trans-species epidemics, and can co-exist within responses to any one event, contingency or crisis. But terms like doctrine or principle can imply an idealist script that stands apart from and pre-exists any actual case. I use the term ‘logic’ to stress that each form of ‘pre’ acting

exceeds any specific case in which futures are acted on, and yet is continually being reassembled in attempts to govern different domains of life. A logic is conditioned by statements about ‘the future’ and by the presence of ‘specific futures’, but it is not equivalent to either for two reasons. First, a logic involves a certain type of intervention to stop, avert, mitigate or adapt to a future that has already been made actionable. Second, a logic involves the rationalization of action in the context of the valuation of certain kinds of life over others. This means that logics are open to rearticulation as they are deployed by different actors in particular policies and programmes. Preemption, precaution and preparedness are, then, transversal to the governmentalities, sovereignties and forms of biopolitics that make up liberal democracies. They work through a ‘mutual presupposition’ (Deleuze, 1988: 37) between the logic and the concrete assemblages of actors (the state, consultancies, think tanks, etc) involved in governing liberal life. The following three subsections discuss each logic in turn, while also highlighting the partial connections between them.

I Precaution

Precaution is perhaps the best known of the three logics, as it is formalized in the ‘precautionary principle’. The principle is generally identified to have emerged in the 1970s in the context of European legal responses to ‘potentially catastrophic’ environmental threats that could be ‘apprehended without being assessed’, that is were characterized by conditions of ‘scientific uncertainty’ (Ewald, 2002). Aradau and Van Munster (2007; 2008) trace its origins to the German *Vorsorgeprinzip* (foresight principle, or taking care before acting), that developed into German environmental law (see Adams, 1995, who traces it to marine protection). Although there are over 14 definitions of the precautionary principle (Sunstein, 2005; Feintuck, 2005), precaution can be understood as a preventative

logic with two characteristics. First, preventative action is separate from the processes it acts on. The object of precaution could develop a catastrophic outcome if the precautionary act was not to take place (Massumi, 2007). Precaution begins once a determinate threat has been identified, even if that threat is scientifically uncertain. Second, precautionary logics act before the identified threat reaches a point of irreversibility (Ewald, 2002: 287). The key question thereafter concerns proportionality: is the response in proportion to the scope of the threat?⁹ There is a need, therefore, to constantly assess the balance between what the threat could become and the costs of (in)action in the present.

Some of the most high-profile calls for precautionary action have emerged in relation to the possible impacts of anthropogenic climate change, where action is utterly dependent on care in the present for future human or non-human life (Adam and Groves, 2008). Urgent action is called for because of, rather than despite, the uncertainty of the links between emission scenarios, temperature changes and impacts. Stochastic modelling underpinned the Stern Review on the Economics of Climate Change, to give one high-profile example, because of uncertainties about the costs, size, location and timing of impacts.¹⁰ There has also been an increasing technical and popular emphasis on a series of worst-case 'system change/surprise' scenarios at higher temperatures; sudden collapse of the West Antarctic ice sheet, extreme weather events and mass species extinctions, for example (Stern, 2007). In this context forms of preventative action have been repeatedly called for that would stabilize greenhouse gas atmospheric concentrations in the range of ≈ 450 – 550 ppm of CO₂-equivalent. This has led to cycles of hope around various measures to reduce emissions, through pricing carbon, encouraging lifestyle change and developing low carbon technologies, as well as calls for adaptation (eg, Fleming, 2006; Stern, 2007; Fussel, 2007; Hulme, 2008).

Consider one preventative mitigation measure that has been deployed in the transnational governance of climate change – carbon offsets (after Bumpus and Liverman, 2008). Offsets are now the centrepiece of efforts to cut emissions by establishing an appropriate price for carbon. Carbon offsets involve the conversion of reductions in carbon emissions to marketable commodities that are then traded and consumed in a global market. The result has been a complex set of spatial relations whereby excess emissions in one place (usually in the global North) are compensated for by reductions in another (usually in the global South) (Bumpus and Liverman, 2008: 131). There is much to say about offsets, not least the market-based relations and inequalities that are formed by making carbon into a commodity (Liverman, 2009). For the purposes of this paper, I only want to stress that offsets are legitimized through a precautionary logic. First, they have become a central means of mitigating climate change before it has reached a point of irreversibility, but after it has emerged as a determinate threat that requires urgent action. Offsets are a proactive mechanism to stop a series of already ongoing processes that may lead to adverse impacts, namely the generation of emissions. Second, offsets are a market-based mitigation measure. As such, they provide one example of the deployment of market solutions as the means of anticipatory action (Bumpus and Liverman, 2009). The life to be saved through offsets is, more specifically, a capitalist life of continual capital accumulation and growth (Swyngedouw, 2007). The presumption is that delay may be far more costly to that life, even if absolute proof of impacts and effects is lacking.

2 Preemption

There are a number of similarities between precaution and the second logic that I want to discuss – preemption: the emphasis on action under conditions of uncertainty about a future

event, a focus on emergent threat in a world of interdependencies and circulations, and a generative role given to collective apprehension (Cooper, 2006; Furedi, 2007; Aradau and Van Munster, 2007; de Goede, 2008b). Furthermore, the shared emphasis on potential or actual threat means that both break with the logic of risk, by which I mean risk as ‘calculable uncertainty’ (Knight, 1921) based on the induction of frequency and harm from the past distribution of events.¹¹ While acknowledging these connections, I think there is, however, a difference in how each intervenes in life. As we saw in the previous subsection, the form of action that characterizes precaution is the stopping or halting of something before it reaches a point of irreversibility. As Massumi (2007) might put it, precaution is parasitic. It acts on processes that have an actual or possible existence prior to the intervention and does so on the basis of a determinate empirically apprehended threat. Preemption is different; it acts over threats that have not yet emerged as determinate threats, and so does not only halt or stop from a position outside. Its form of intervention is incitatory and it is justified on the basis of indeterminate potentiality (Massumi, 2007: 14). Preemptive acts become immersed in the conditions of emergence of a threat, ideally occurring before a threat has actually emerged (Cooper, 2006; Massumi, 2007).

The most high-profile examples of preemptive action have been in the context of the so called ‘war on terror’ (although see the rise of geo-engineering as a solution to climate change that aims to create life, albeit after the emergence of a threat; Fleming, 2006; Cooper, 2007). The US 2002 National Security Strategy explicitly and infamously articulated a shift from a posture of mutual deterrence to ‘anticipatory action’ against ‘[e]merging threats before they are fully formed’ (US Government, 2002: 4). Preemptive war has damaged and destroyed life in spaces of occupation, ruination and torture (Gregory, 2004; Hannah, 2006), and everyday

circulations and transactions have been preemptively secured (Amoore and de Goede, 2008; Adey, 2009). What characterizes such preemptive action is that it is generative. In relation to a present that is unbalanced by potential threats, preemptive logics work by unleashing transformative events in order to avoid a rupture in a valued life. The power of creativity is harnessed. In comparison with the emphasis on continuity that we find in precaution, preemption unashamedly makes and reshapes life (Martin, 2007). In the context of the Iraqi war, for example, this has involved a redistribution of the potential for catastrophe from ‘zones of liberal peace’ to lives that are subject to advanced techniques of damage and destruction (Gregory, 2006; 2008). But other supposedly unintended effects of preemptive action have been extensively documented, not least the proliferation of new security threats. It would be easy to see these effects as separate from the logic of preemption and describe them as mistakes. However, such consequences are neither failures nor successes, because in a preemptive logic inaction is not an option so unintended effects are unavoidable. Indeed, as a mode of intervention preemption is indifferent to those generative effects. Why? Because the proliferating effects of preemption may generate something else: opportunities to be seized (Martin, 2007). We see this in the case of the geoeconomics of the 2003 Iraq war. In inciting its adversary to take form, preemptive war in Iraq opened up lucrative markets for private security firms and contractors as well as short-term investment opportunities for finance capital (Martin, 2007). Unlike precaution, which aims to preserve a valued life through prevention, preemptive logics work by proliferating effects and creating life, albeit in the case of the ‘war on terror’ lives that have been abandoned and dispossessed.

3 Preparedness

If preemption and precaution are based on action that aims to prevent the occurrence of a future,

the third logic prepares for the aftermath of events. Preparedness shares the same problem: how to act on indeterminate/uncertain futures emergent from a complex set of flows and connections (Lakoff, 2006). But the response differs from the other two logics in one critical way: both precaution and preemption aim to stop the occurrence of a future, by either stopping a process before it reaches a point of irreversibility or initiating a new process. Preparedness is different. Its sphere of operation is a series of events after a precipitating event. Unlike precaution or preemption, preparedness does not aim to stop a future event happening. Rather, intervention aims to stop the *effects* of an event disrupting the circulations and interdependencies that make up a valued life (Lakoff, 2007; Collier and Lakoff, 2008).

For one example of this type of intervention, consider 'UK preparedness' post the 2004 UK Civil Contingencies Act. UK preparedness emerged after a series of disruptive events, including Y2K, the fuel crisis and foot-and-mouth disease. The focus is on detecting, preventing and handling contingencies through a distributed network of central, regional and local organizations (Medd and Marvin, 2005). These include local authorities and emergency services, but also extend to industry, voluntary organizations and non-governmental organizations. The emphasis is on developing the capabilities necessary to respond to a series of disruptive future events. The relation with life is twofold. First, the aim is to care for any life that might be exposed to disaster. Central to UK preparedness has been an emphasis on post-disaster vulnerability. Second, life is understood in terms of the infrastructures that support businesses, normally figured through the vocabularies of 'critical infrastructure protection' (telecommunications, power, sanitation and so on) or 'business continuity' (Coaffee *et al.*, 2008). The emphasis is on mitigating the effects of an event in order to enable certain processes to continue and a valued life to be sustained.

This means that the relation to a life of permanent emergency is different in preparedness. Like preemption, preparedness involves becoming immanent to life, but in a different way. In the UK context the aim has been to build the capacity of 'resilience' into the very life that is to be secured. A term that originated in ecology or physics (the origins are contested), but is now used in social psychology, disaster management and organizational studies (Manyena, 2006), a resilient system is one that can adapt, transform and recover post events. Take, for example, the development of two partially connected spaces of preparedness in UK cities: first, an architecture of humanitarian assistance, in particular a set of rest centres, emergency medical centres and evacuation points that are designed to provide care to all individuals regardless of legal status; second, a set of spaces that aim to sustain continuity of function and process for businesses, such as anonymous industrial units that house 'back-up' communication systems (Coaffee *et al.*, 2008). In both cases the deployment of preparedness techniques becomes part of the infrastructure of urban life. The city is made 'resilient' as a way of preparing for the occurrence of unpredictable events.

Precaution, preemption and preparedness are all means of guiding action once the future has been problematized in a certain way – as a disruptive surprise – and each are deployed once specific futures have been made present through practices of calculation, performance or imagination. But all do something else as well. From the three brief examples, all of which I should stress are also bound up with other spatialities and temporalities, we can get a sense of how anticipatory action (re)distributes the relationship that lives within and outside liberal democracies have to disaster. To protect, save and care for certain forms of life is to potentially abandon, dispossess and destroy others. We saw this relation briefly in each example: the continuity of the market is protected through offsets, a liberal

Table 2. Anticipatory logics

	Precaution	Preemption	Preparedness
Stage of intervention	After the identification of a threat, before the irreversibility of the threatened damage	Before the formation and identification of a determinate threat	During the propagation of the effects or impacts of an event across life
Uncertainty/ indeterminacy	Named possible future	Potential 'high impact, low probability' future	Generic 'as if' future
Mode of action	Decisions to constrain or halt from a position outside a process and before that process becomes irreversible	Creation of life through an immersion in the conditions of formation for a threat	The development of capabilities and resiliences that will enable response after an event has occurred
Example policies and programmes	Moratoriums on new technologies, climate change mitigation, new counterterrorism laws	Preemptive war, geo-engineering, the creation of new viruses as part of infectious disease control	Resilience, emergency planning, critical infrastructure protection

democratic 'way of life' linked to late capitalism is protected through the sovereign act of preemptive war, and life as human species being and infrastructure is protected in a distributed system of preparedness.

Taking a step back from these examples, we can pose a series of questions about anticipatory action and the power relations that make up liberal democracies. First, how are different forms of anticipatory action imbricated with sovereign actions, such as violent interventions, or the implantation of emergency measures (Dean, 2007)? How are sovereign decisions to act on the basis of a future taken and announced? Alternatively, how are decisions automated, dispersed or delegated in networks of liberal governmentality? Second, what form of life is valorized now and in the future? How are different forms of anticipatory action imbricated in the changing biopolitics of life and death, of making live and letting die? Third, how is conduct conducted in relation to different types of anticipatory action, and the specific networks of governance through which precaution, preemption and preparedness are deployed?

Answering the above questions demands detailed empirical work sensitive to the operation of anticipatory logics in relation to plural

relations of power. A logic does not have a primary actor, primary target or characteristic spatial form. These will be contextual. For heuristic purposes, Table 2 offers a formalization of each logic based on their current use and deployment.

This initial categorization of different logics raises a number of further questions for research on the genealogy of each logic. How have the different logics been invented, formalized and utilized in relation to specific events and conditions? What differences are there within each logic as they are legitimized, contested, and enacted in specific domains of life? How do different logics co-exist, and thus support or contradict one another? And how have various forms of dissent emerged around the deployment of each logic?

V Conclusion: Space and futurity

Anticipatory action is a key means through which life in contemporary liberal democracies is secured, conducted, disciplined and normalized. Governing the future begins from an equation between the space-times of life and contingency. With the consequence that the future is problematized as a surprise – an open set of endless possibilities – rather than the

predictable outcome of present trends or past occurrences. Against this background, anticipatory action functions by (re)making life tensed on the verge of catastrophe in ways that protect, save and care for certain valued lives, and damage, destroy and abandon other lives. The starting point for this paper was that we currently lack the conceptual vocabulary to understand processes whereby a future is made present and becomes a cause for action. Periodic calls for ‘future geographies’, or the ‘future of Geography’, suggest that geographers remain too wedded to the assumption that the future is either a blank or a telos. In contrast I begin from the presence of the future and the experience of that presence. More specifically, I have argued that an analytics of how anticipatory action functions should attend to: *styles*, consisting of statements that disclose and relate to the form of the future; *practices*, consisting of acts that make specific futures present; and *logics*, consisting of interventions in the here and now on the basis of futures.

What wider implications might such a study hold for human geography? In the background to the paper is an assumption that anticipatory action can only be adequately engaged with if we reflect on the spatial-temporal category of ‘the future’. The paper has tried to take the first steps towards doing this. As such, the concepts, methods and sensibilities used to understand the dynamics of anticipatory action hold two wider implications for social/spatial theory.

First, work could attend to the presence of the future in any and all geographies. The future is not only a blank or connected to the present through a relation of succession. Nor is the future only a mystery to be waited for (Rose, 2007), a not-yet that gives hope (Anderson, 2006a), or a virtuality to become worthy of (Dewsbury, 2007). It may be all these, but the future is also present while remaining absent – whether that be in models, expectations, scenarios, hopes, or in countless other ways. For me, it is the relation between the ‘presence of the

future’ and the dynamics of a ‘living present’ that should be focused on (just as work on haunting attends to the persistence of the past, thus revealing the here and now to be fractured (Edensor, 2005; Wylie, 2007; Adey and Maddern, 2008)). I think we risk passing over how geographies are made through the constant folding of futures into the here and now if we equate ‘the future’ with the disruptive eruption of the unexpected (in part after Derrida’s ‘messianicity without messianism’; Rose, 2007). While finding a huge amount of value in such a project, the paper opens up a different set of tasks: to attend to how futures appear and disappear; to describe how present futures are intensified, blurred, repressed, erased, circulated or dampened; and to understand how the experience of the future relates to the materiality of the medium through which it is made present, whether that be a graph or an affective atmosphere.

The second wider implication of the paper is that we should reflect on the assumptions about the future that are embedded in our extant habits and techniques of thinking. Geographers are constantly addressing the future, just for the most part not explicitly. Nevertheless, ‘the future’ will be disclosed and related to in many ways: as unknowable mystery, as repetition, as reoccurrence, as a to-come and so on. As soon as we denaturalize the category of the future by acknowledging these differences, it becomes necessary to reflect on how we relate to the future and how we might want to relate differently. Consider two possible ways of relating to the future in the context of the proliferation of anticipatory action. First, work could supplement how futures are made present by anticipating other desired futures through a range of utopic sensibilities, skills and techniques. These would imagine contestable visions of *possible* or *not-yet* spatial futures (after Pinder, 2005; Anderson, 2006a; Gibson-Graham, 2006; Kraftl, 2007). One example is Connolly’s (2008) vision of an eco-egalitarian capitalism in the context of

climate change. Working on the relays between affect and political action, his wager is that a vision of a different and better future will have a motive force that animates action to reduce environmental injustices. Second, work could aim to scramble attempts to create desired futures by welcoming the unanticipated and thereafter cultivating the irruption of *virtual* or *to-come* futures (after McCormack, 2003; Dewsbury, 2007; Hinchliffe, 2007; Rose, 2007; Bingham, 2008). Here Haraway's (2008) work is exemplary for the generous style with which she welcomes how species might intermingle in the context of the extension of forms of biosecurity. What do these two ways of relating to 'the future' teach us, beyond a need to think through in more depth how we conceptualize the future? Questions of what type of future we may want remain vital (although this very question presumes a lot about the future). However, the second wider lesson of the paper is that desired futures can be made present through multiple ways of anticipating, welcoming, waiting for or otherwise relating to the future. As we have seen, there are too many ways of inhabiting what Augustine termed 'the time present of things future' to advocate one ideal way of relating to the future. Nevertheless, experimenting with such relations is necessary because to fold alternative futures into the here and now is to open up the chance of new possibilities; just as recovering overlooked pasts has long been recognized as a means of disclosing new and different future geographies.

The paper has offered a series of starting points for research on how anticipatory action happens and a thinking of geography's relation with futurity. What such a study promises is a mode of inquiry that would attend to the presence of futures while learning to experiment with its own relation to futurity.

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Notes

1. The term 'liberal-democratic' is used to signal the scope of the paper: North American and western European societies under a 'diagram of government' that can be termed neoliberalism or advanced liberalism (notwithstanding differences between these terms) (Rose, 1999). I take it that liberal democracies are characterized by a complex plurality of power relations – including sovereignties, governmentalities, and forms of biopolitics (Dean, 2007) – and therefore a plurality of sources and agents of power. The term 'liberal life' is used to specify that the life to be valued and protected through anticipatory action is understood in terms of self-activating 'freedoms' – specifically personal freedoms and the freedoms of commerce.
2. See <http://www.climatehotmap.org>
3. Here I am referring to an iterative process whereby obstacles are translated into problems to which emergent solutions respond (rather than the representation of a pre-existent object or creation of an object that did not exist) (Foucault, 1997b: 388–89). What is emphasized in Foucault's comments on problematization is, on the one hand, the reciprocal relation between a problem and its solutions and, on the other, the gap between a problem and solutions. Styles, logics and practices name partially connected registers across which solutions unfold to the problem of how to act over an indeterminate/uncertain future.
4. A note here is necessary on Beck's (1992) risk society thesis – perhaps the most high-profile account of the proliferation of catastrophic and uninsurable risk. Rather than working within a distinction between 'calculability' and 'incalculability', and showing how certain modern risks exceed a calculus of risk, the paper details some, by no means all, of the ways that are being invented and deployed to render indeterminate futures actionable.

5. See St Augustine, Book Eleven, Chapter 20 (see Chadwick, 1998).
 6. Specifically, exceedence probability curves (EPC) and average annual losses (AAL). EPCs fix the annual probability of exceeding a certain level of loss. AAL refers to the average annual loss from the modelled peril over time if the exposure remains constant.
 7. By 'thetic' I mean the ontic status that is imputed to imagined or performed objects, state of affairs, or processes. There is a range of such thetic qualities or properties, including real, unreal, potential and possible (Casey, 1976).
 8. The Foresight Directorate is currently housed in the UK's Department for Innovation, Universities, and Skills. For more detail, see <http://www.foresight.gov.uk>
 9. A version of the precautionary principle is embedded in Article 3.3 of the UNFCCC and its Kyoto protocol, for example. It reads: 'Where there are threats of serious or irreversible damage, lack of full scientific certainty should not be used as a reason for postponing such measures, taking into account that policies and measures to deal with climate change should be cost-effective so as to ensure global benefits at the lowest possible costs' (Article 3.3).
 10. The Stern Review was based on the 'Policy Analysis of the Greenhouse Effect 2002' model that produces estimates based on a Monte Carlo simulation (Stern, 2007).
 11. This is a deliberately truncated definition that uses term 'risk' to refer to the (statistical) calculation of the probability of an event happening and of impact, a calculation that makes room for an open future, in particular through an emphasis on probabilities, but only in a limited way because the future is the outcome of past causes (Ewald, 1991; Luhmann, 1993). The distinctions within and between logics and practices is an attempt to specify the novel ways in which futures are now being anticipated and acted on.
- References**
- Adam, B. and Groves, C. 2008: *Future matters: action, knowledge, ethics*. London: Brill.
- Adams, J. 1995: *Risk*. London: UCL Press.
- Adey, P. 2009: Facing airport security: affect, biopolitics and the preemptive securitization of the mobile body. *Environment and Planning D: Society and Space* 27, 274–95.
- Adey, P. and Mattern, J. 2008: Editorial: spectro-geographies. *Cultural Geographies* 15, 291–95.
- Amin, A. and Cohendet, P. 2004: *Architectures of knowledge: firms, capabilities, and communities*. Oxford: Oxford University Press.
- Amoore, L. 2007: Vigilant visualities: the watchful politics of the war on terror. *Security Dialogue* 38, 215–32.
- Amoore, L. 2008: Algorithmic war: everyday geographies of the war on terror. *Antipode* 41, 49–69.
- Amoore, L. and de Goede, M. 2008: The banal face of the preemptive strike. *Transactions of the Institute of British Geographers* NS 33, 173–85.
- Anderson, B. 2006a: Transcending without transcendence: utopianism and an ethos of hope. *Antipode* 38, 691–710.
- Anderson, B. 2006b: Becoming and being hopeful: towards a theory of affect. *Environment and Planning D: Society and Space* 24, 733–52.
- Anderson, B. 2007: Hope for nanotechnology: anticipatory knowledge and the governance of affect. *Area* 19, 156–65.
- Anderson, B. 2010: Security and the future: anticipating the event of terror. *Geoforum* 41, 227–35.
- Aradau, C. and Van Munster, R. 2007: Governing terrorism through risk: taking precautions, (un)knowing the future. *European Journal of International Relations* 13, 89–115.
- Aradau, C. and Van Munster, R. 2008: Taming the future: the dispositif of risk in the war on terror. In Amoore, L. and de Goede, M., editors, *Risk and the war on terror*, Abingdon: Routledge, 23–40.
- Beck, U. 1992: *Risk society: towards a new modernity*. London: Sage.
- Bingham, N. 2008: Slowing things down: lessons from the GM controversy. *Geoforum* 39, 111–22.
- Blumenberg, H. 1985: *The legitimacy of the modern age*. Cambridge, MA: MIT Press.
- Bougen, P. 2003: Catastrophic risk. *Economy and Society* 32, 253–74.
- Boykoff, M. 2008: The cultural politics of climate change discourse in UK tabloids. *Political Geography* 27, 549–69.
- Budd, J. and Adey, P. 2009: The software simulated airworld: anticipatory code and affective aeromobilities. *Environment and Planning A* 41, 1366–85.
- Bumpus, A.G. and Liverman, D.M. 2008: Accumulation by decarbonisation and the governance of carbon offsets. *Economic Geography* 84, 127–56.

- Braun, B. 2007: Biopolitics and the molecularisation of life. *Cultural Geographies* 14, 6–28.
- Casey, E. 1976: *Imagining*. Bloomington, IN: Indiana University Press.
- Chadwick, H., translator 1998: *Saint Augustine: confessions*. Oxford: Oxford University Press.
- Clarke, L. 2005: *Worst cases: terror and catastrophe in the popular imagination*. Chicago. University of Chicago Press.
- Coaffee, J., Rogers, P. and Wood, D. 2008: *The everyday resilience of the city: how cities respond to threat and terrorism*. London: Palgrave.
- Cohen, P. 1999: *A calculating people: spread of numeracy in early America* (second edition). London: Routledge.
- Collier, S. 2008: Enacting catastrophe: preparedness, insurance, budgetary rationalisation. *Economy and Society* 37, 224–50.
- Collier, S. and Lakoff, A. 2008: Distributed preparedness: the spatial logic of domestic security in the United States. *Environment and Planning D: Society and Space* 26, 7–28.
- Connolly, W.E. 2008: *Capitalism and Christianity: American style*. Durham, NC: Duke University Press.
- Cooper, M. 2004: On the brink – from mutual deterrence to uncontrollable war. *Contretemps* 4, 2–18.
- Cooper, M. 2006: Pre-empting emergence: the biological turn in the War on Terror. *Theory, Culture and Society* 23(4), 113–35.
- Cooper, M. 2007: *Life as surplus: biotechnology and capitalism in the neoliberal era*. Seattle, WA: University of Washington Press.
- Daston, L. and Galison, P. 1992: The image of objectivity. *Representations* 40, 81–128.
- Davis, T. 2007: *Stages of emergency: cold war era civil defence*. Durham, NC: Duke University Press.
- Dean, M. 2007: *Governing societies*. London: Sage.
- de Goede, M. 2008a: Beyond risk: premediation and the post-9/11 security imagination. *Security Dialogue* 39, 155–76.
- de Goede, M. 2008b: Risk, preemption and exception in the war on terrorist financing. In Amoore, L. and de Goede, M., editors, *Risk and the War on Terror*, Abingdon: Routledge, 87–111.
- Deleuze, G. 1988: *Foucault*. London: Athlone.
- Der Derian, J. 2001: *Virtuous war*. Boulder, CO: Westview Press.
- Derrida, J. 2003: Autoimmunity: real and symbolic suicides – a dialogue with Jacques Derrida. In Borradori, G., editor, *Philosophy in a time of terror: dialogues with Jurgen Habermas and Jacques Derrida*, Chicago: University of Chicago Press, 85–136.
- Dewsbury, J.-D. 2007: Unthinking subjects: Alain Badiou and the event of thought in thinking politics. *Transactions of the Institute of British Geographers* NS 32, 443–59.
- Dillon, M. 2003: Virtual security. A life science of (dis)order. *Millennium Journal of International Studies* 32, 531–59.
- Dillon, M. 2007: Governing through contingency: the security of biopolitical governance. *Political Geography* 26, 41–47.
- Dillon, M. and Lobo-Guerrero, L. 2008: Biopolitics of security in the 21st century: an introduction. *Review of International Studies* 34, 265–92.
- Dillon, M. and Reid, J. 2009: *The liberal way of war*. Abingdon: Routledge.
- Diprose, R., Stephenson, N., Mills, C., Race, K. and Hawkins, G. 2008: Governing the future: the paradigm of prudence in political technologies of risk management. *Security Dialogue* 39, 267–88.
- Donaldson, A. 2008: Biosecurity after the event: risk politics and animal disease. *Environment and Planning A* 40, 1552–67.
- Edensor, T. 2005: *Industrial ruins: space, aesthetics and materiality*. London: Berg.
- Ericson, R. 2007: *Crime in an insecure world*. Cambridge: Polity.
- Ericson, R. and Doyle, A. 2004: Catastrophic risk, insurance and terrorism. *Economy and Society* 33, 135–73.
- Erikson, K. 1994: *A new species of trouble: explorations in disaster, trauma, and community*. London: W.W Norton and Co.
- Evans, B. 2010: Anticipating fatness: childhood, affect and the pre-emptive ‘war on obesity’. *Transactions of the Institute of British Geographers* NS 35, 21–38.
- Evans, B. and Colls, R. 2009: Measuring fatness, governing bodies: the spatialities of the body mass index in anti-obesity politics. *Antipode* 41, 1051–83.
- Ewald, F. 1991: Insurance and risk. In Burchell, G., editor, *The Foucault effect: studies in governmental rationality*, Hemel Hempstead: Harvester Wheatsheaf, 197–210.
- Ewald, F. 2002: The return of Descartes’ malicious demon: an outline of a philosophy of precaution. In Baker, T. and Simon, J., editors, *Embracing risk: the changing*

- culture of insurance and responsibility*, Chicago: Chicago University Press, 273–301.
- Feintuck, M. 2005: Precautionary maybe, but what's the principle? The precautionary principle, the regulation of risk, and the public domain. *Journal of Law and Society* 32, 371–98.
- Feldman, A. 2006: Securocratic wars of public safety. *Interventions: International Journal of Postcolonial studies* 6, 330–50.
- Fleming, J. 2006: The pathological history of weather and climate modification: three cycles of promise and hype. *Historical Studies in the Physical and Biological Sciences* 37, 3–25.
- Foucault, M. 1997a: Nietzsche, genealogy, history. In Radinbow, P., editor, *The Foucault reader*, London: Penguin, 76–100.
- Foucault, M. 1997b: Polemics, politics, and problematizations: an interview with Michel Foucault. In Radinbow, P., editor, *The Foucault reader*, London: Penguin, 381–90.
- Foucault, M. 2007: *Security, territory and population. Lectures at the Collège de France 1977–1978*. London: Palgrave.
- Foucault, M. 2008: *The birth of biopolitics. Lectures at the Collège de France, 1978–1979*. London: Palgrave.
- Furedi, F. 2007: *Invitation to terror*. London: Continuum.
- Fussler, H.-M. 2007: Adaptation planning for climate change: concepts, assessment approaches and key lessons. *Sustainability Science* 2, 265–75.
- Galloway, A. and Thacker, E. 2007: *The exploit: a theory of networks*. Minneapolis, MN: University of Minnesota Press.
- Ghamari-Tabrizi, S. 2005: *The worlds of Herman Kahn*. Cambridge, MA: Harvard University Press.
- Gibson-Graham, J.-K. 2006: *Post-capitalist politics*. Minneapolis, MN: University of Minnesota Press.
- Giddens, A. 1991: *Modernity and self-identity*. London: Polity.
- Gregory, D. 2004: *The colonial present*. Oxford: Blackwell.
- Gregory, D. 2006: The black flag: Guantánamo Bay and the space of exception. *Geografiska Annaler* 88, 405–27.
- Gregory, D. 2008: The biopolitics of Baghdad. Counter-insurgency and the counter-city. *Human Geography* 1, 6–27.
- Grusin, R. 2004: Premediation. *Criticism* 46, 17–39.
- Hacking, I. 1976: *The emergence of probability*. Cambridge: Cambridge University Press.
- Hacking, I. 1990: *The taming of chance*. Cambridge: Cambridge University Press.
- Hannah, M. 2006: Torture and the ticking bomb: the war on terrorism as a geographical imagination of power/knowledge. *Annals of the Association of American Geographers* 96, 622–40.
- Haraway, D. 2008: *When species meet*. Minneapolis, MN: University of Minnesota Press.
- Harvey, D. 2000: *Spaces of hope*. Edinburgh: Edinburgh University Press.
- Hinchliffe, S. 2007: *Geographies of nature: societies, environments, ecologies*. London: Sage.
- Hinchliffe, S. and Bingham, N. 2008: Securing life: the emerging practices of biosecurity. *Environment and Planning A* 40, 1534–51.
- Hulme, M. 2008: The conquering of climate: discourses of fear and their dissolution. *The Geographical Journal* 174, 5–16.
- Hulme, M. and Dessai, S. 2008a: Predicting, deciding, learning: can one evaluate the 'success' of national climate scenarios? *Environmental Research Letters* 3, 045013, DOI: 10.1088/1748-9326/3/4/045013.
- Hulme, M. and Dessai, S. 2008b: Negotiating future climates: a critical review of the development of climate scenarios for the UK. *Environment Science and Policy* 11, 54–70.
- Jameson, F. 2005: *Archaeologies of the future*. London: Verso.
- Kahn, H. 1962: *Thinking about the unthinkable*. London: Weidenfeld and Nicolson.
- Keil, R. and Ali, H. 2006: The avian flu: some lessons learned from the 2006 SARS outbreak in Toronto. *Area* 38, 107–109.
- Kinpaisby, Mrs 2008: Taking stock of participatory geographies: envisioning the communiversity. *Transactions of the Institute of British Geographers* NS 33, 292–99.
- Kitchin, R. and Kneale, J. 2002: *Lost in space: geographies of science fiction*. London: Continuum.
- Knight, F. 1921: *Risk, uncertainty and profit*. Boston, MA: Houghton Mifflin Company.
- Kraftl, P. 2005: Building an idea. The material construction of an ideal childhood. *Transactions of the Institute of British Geographers* NS 31, 488–504.
- Kraftl, P. 2007: Utopia, performativity, and the unhomely. *Environment and Planning D: Society and Space* 25, 120–43.

- Lakoff, A. 2006: From disaster to catastrophe: the limits of preparedness. Retrieved 11 February 2010 from <http://understandingkatrina.ssrc.org/Lakoff>
- Lakoff, A. 2007: Preparing for the next emergency. *Public Culture* 19, 247–71.
- Lakoff, A. 2008: The generic biothreat, or, how we became unprepared. *Cultural Anthropology* 23, 399–428.
- Latour, B. 1987: *Science in action*. Milton Keynes: Open University Press.
- Liverman, D. 2009: Conventions of climate change: constructions of danger and the dispossession of the atmosphere. *Historical Geography* 35, 279–96.
- Lobo-Guerrero, L. 2007: Biopolitics of specialist risk: kidnap and ransom insurance. *Security Dialogue* 38, 315–34.
- Luhmann, N. 1993: *Risk*. London: Sage.
- Manyena, S. 2006: The concept of resilience revisited. *Disasters* 30, 433–50.
- Martin, R. 2007: *An empire of indifference: American war and the financial logic of risk management*. Durham, NC: Duke University Press.
- Massey, D. 2005: *For space*. London: Sage.
- Massumi, B. 2005a: *The future birth of an affective fact*. Conference Proceedings: Genealogies of Biopolitics. Retrieved 11 February 2010 from browse.reticular.info/text/collected/massumi.pdf
- Massumi, B. 2005b: Fear (the spectrum said). *Positions* 13, 31–48.
- Massumi, B. 2007: Potential politics and the primacy of preemption. *Theory and Event* 10(2), DOI: 10.1353/tae.2007.0066.
- McCormack, D.P. 2003: An event of geographical ethics in spaces of affect. *Transactions of the Institute of British Geographers* NS 28, 488–507.
- Medd, W. and Marvin, S. 2005: From the politics of urgency to the governance of preparedness: a research agenda on urban vulnerability. *Journal of Contingencies and Crisis Management* 13(2), 44–49.
- Ophir, A. 2007: The two-state solution: providence and catastrophe. *Theoretical Inquiries in Law* 8(1), article 7. Retrieved 11 February 2010 from <http://www.bepress.com/til/default/vol8/iss1/art7>
- O'Toole, T., Mair, M. and Inglesby, T. 2002: Shining light on 'Dark Winter'. *Clinical Infectious Diseases* 34, 972–83.
- Pile, S. 2005: *Real cities: modernity, space and the phantasmagorias of city life*. London: Sage.
- Pinder, D. 2005: *Visions of the city: utopianism, power and politics in twentieth century urbanism*. Edinburgh: Edinburgh University Press.
- Posner, R. 2004: *Catastrophe: risk and response*. Oxford: Oxford University Press.
- Reith, G. 2004: Uncertain times. The notion of 'risk' and the development of modernity. *Time and Society* 2/3, 383–402.
- Risk Management Solutions (RMS) 2008: Managing influenza pandemic risk. Retrieved 11 February 2010 from http://www.rms.com/Publications/Influenza_Pandemic_Risk.pdf
- Rose, M. 2007: The problem of power and the politics of landscape: Stopping the Greater Cairo ring road. *Transactions of the Institute of British Geographers* NS 32, 460–77.
- Rose, N. 1999: *Powers of freedom: reframing political thought*. Cambridge: Cambridge University Press.
- Salter, M. 2008: Risk and imagination in the War on Terror. In Amooore, L. and de Goede, M., editors, *Risk and the War on Terror*, Abingdon: Routledge, 233–46.
- Schoch-Spana, M. 2004: Bioterrorism. US public health and a secular apocalypse. *Anthropology Today* 20(5), 8–13.
- Smith, D. 2000: *Moral geographies: ethics in a world of difference*. Edinburgh: Edinburgh University Press.
- Stern, N. 2007: *The economics of climate change: the Stern report*. Cambridge: Cambridge University Press.
- Sunstein, C. 2005: *Laws of fear: beyond the precautionary principle*. Cambridge: Cambridge University Press.
- Swyngedouw, E. 2007: Impossible 'sustainability' and the post-political condition. In Krueger, R. and Gibbs, D., editors, *The sustainable development paradox*, New York: Guilford Press, 13–40.
- Thrift, N. 2007: *Non-representational theory: space, politics, affect*. Abingdon: Routledge.
- UK Government 2009: The United Kingdom's strategy for countering international terrorism. Retrieved 11 February 2010 from http://security.homeoffice.gov.uk/news-publications/publication-search/general/HO_Context_strategy
- US Government 2002: *The national security strategy of the United States of America*. Washington, DC: US Government.
- Wolch, J. 2007: Green urban worlds. *Annals of the Association of American Geographers* 97, 373–84.
- Wylie, J. 2007: The spectral geographies of W.G. Sebald. *Cultural Geographies* 14, 171–88.
- Zedner, L. 2007: Pre-crime and post-criminology? *Theoretical Criminology* 11, 261–81.