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**There's More to Life than Biopolitics:
Critical Infrastructure, Resilience Planning, and Molecular Security**

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Abstract

This paper examines how the management of populations can be analysed in relation to the spatial and material arrangement of critical infrastructure and resilience planning.

Specifically, we investigate how this arrangement and planning establish connections between bodies and spaces in ways that make it extremely difficult to disentangle the 'population' from the material objects that condition its movements. Here our focus is not on the 'exceptional' dimensions of security, but rather on the everyday and otherwise mundane aspects of critical infrastructure, such as telecommunications networks, electronic cables, and sewage/water treatment works. An approach that seeks to recover the political force of materiality allows for discussion of the vital roles that these otherwise invisible objects perform in national security assemblages. Our interest is in how sovereign attempts to secure these material apparatuses, particularly in the US context, produce populations in ways that enable new forms of governance in the context of the war on terror. Adopting, yet at the same time calling for a more nuanced, biopolitical perspective, we argue that it is precisely through these molecular practices of security that diverse and heterogeneous subjectivities are produced *as* governable populations in the first place. By recovering the molecular composition of CIs, however, we also draw attention to the otherwise neglected aspect of the manifold back-fires within and resistances to these apparatuses, which serves as a reminder that, ultimately, there is more to life than biopolitics.

Introduction

In recent years, Western governments have invested significantly in the enhancement of critical infrastructures (CIs). One influential definition of CIs is offered by the United States (US) Department of Homeland Security (DHS) as ‘the framework of physical structures and cyber information networks that provides a continual flow of information, goods, and services essential to the defence and economic security of the US’ (DHS, 2004: 1). Similar definitions can be found in the United Kingdom (UK) and European Union (EU) contexts, all of which stress the importance of such networks for the functioning of everyday life and the return to ‘normality’ in the event of natural disasters, accidents, or terrorist attacks. One example of recent activity is the EU Commission’s attempt to develop information technologies. Though invisible, Critical Information Infrastructures (CIIs) are viewed by the Commission as vital to European economy and society. Indeed, according to the World Economic Forum, there is a 10-20% likelihood of a major CII breakdown in the EU within the next 10 years, which could result in financial losses equivalent to US \$250 billion. Any form of disruption to and/or destruction of CIIs would therefore have a serious impact across Europe (EU Commission, 2009). Other sectors typically encompassed by CIs include: agriculture and food; water, sewage works and public health; emergency services; energy supply; banking and finance; and transportation systems. As such, CIs are intimately interwoven with the fabric of societies and the stakes of CI planning are high.

Of course, the provision and maintenance of adequate CIs is not a ‘new’ phenomenon, nor one confined to the ‘West’. Rather, CIs are associated with the quintessence of statehood both historically and globally – as, for example, reflected in the basis for popular criticism of the government’s failure to prepare for and mitigate against the catastrophic effects of the recent

floods in Pakistan. Nevertheless, what is arguably significant about recent efforts to enhance critical infrastructures in the West is both the scale of investment and the extent to which developments in this context have come to permeate and structure economic, social, military, and political sectors. It is no coincidence that such trends have intensified as a result of the attacks on the World Trade Center and Pentagon (2001), and the bombings in Madrid (2003) and London (2005) – attacks that, after all, struck multiple blows at the heart of essential (and highly symbolic) financial and transportation networks vital for the ‘continual flow of information, goods and services’. Furthermore, alongside this investment has emerged the concept of ‘resilience’ around which current security planning, design, policy, and practice increasingly revolves. Here resilient CIs are conventionally understood in terms of systems that demonstrate the ‘ability [...] to withstand and recover from adversity’ (Cabinet Office, 2010: 5). Indeed, so influential has the idea of resiliency become that it has arguably replaced the ‘war on terror’ as the defining motif of contemporary Western security relations – as illustrated by a recent UK Home Office phrase book that called for civil servants to abandon references to the ‘war’ in favour of ‘building resilience against violent extremism and criminal murder’ (quoted in Amore 2008: 130).

The inter-disciplinary study of CIs and resilience planning has developed rapidly. What this literature tends to focus upon, however, is the effectiveness of systems in place and prospects for better policy prescription. Thus, for example, a recent special issue of the *Journal of Contingencies and Crisis Management* dealt with the efficiency of international disaster management planning (LaPorte, 2007), the potential effects of social breakdown following the collapse of CIs (Boin and McConnell, 2007), new design principles to better protect the management of CIs (Schulman and Roe, 2007), and prospects for future European strategy (Fritzon et al, 2007). Elsewhere, Jon Coaffee (2006) has charted the emergence of the

concept of resilience from an urban planning perspective: first as a metaphor for how ecological systems cope with stress induced by external factors; and later in its application to disaster management, economic recovery, and the embedding of emergency preparedness into the built environment of the city. Other work has considered the conceptual history of resilience (Handmer and Dovers 1996), the relation between resilience and risk (Schoon 2006), and legal dimensions of infrastructure (Likosky 2006). What has so far received less attention, however, is the broader significance of the reorientation of Western security relations around CIs and resilience planning: How do sovereign attempts to secure CIs enable certain forms of governance? How do these attempts interact with and produce the populations they seek to govern? How does CI and resilience planning reveal assumptions about contemporary political life in the West?

In this paper we begin by tackling some of the prior conceptual and methodological problems posed by these questions for security studies. The first section considers what is at stake in the move to focus on material apparatuses as referent objects of security. It sketches out an approach that allows for an appreciation of the role that material factors play while at the same time refusing to accept Realist versions of what that must mean. Rather, drawing on the work of Jane Bennett and others, we show how it is possible to recover the ‘political force of materiality’ after the so-called linguistic turn. The second section then outlines in further detail some of the key developments in CI and resilience planning with especial focus on the US as it represents one of the most advanced cases. Here we draw extensively on ‘The National Plan for Research and Development in Support of Critical Infrastructure Protection’ published by the DHS in 2004 to illustrate the centrality of CIs in the US’ vision of homeland security. The third section seeks to address the primary questions identified above by drawing on recent biopolitical analyses of the ‘logic resilience’ offered by Filippa Lentzos and

Nikolas Rose (2009), as well as the ‘infrastructures of liberal living’ by Michael Dillon and Julian Reid (2009). While to a large extent agreeing with the critical purchase of these perspectives, however, we ultimately argue that it is necessary to go further in recognising that CIs are not closed, totalising, and inevitably successful biopolitical apparatuses, but open, vulnerable, and often absurd systems that continually falter, backfire and are resisted by the very populations they seek to govern. Finally, in the fourth section we point to how it might be possible to think about CIs and resilience planning in terms of open systems that do not always work the way they were meant to. To do so we invoke the concept of ‘molecular security’, highlighting the fluctuating boundaries and uncertain identities produced by resilient CIs.

Beyond the ‘Spectacle of Security’: the Political Force of Materiality

While the terrain of security studies is of course fiercely contested, what is common among a range of otherwise often diverse perspectives is the core premise that ‘security’ relates to a realm of activity in some sense beyond the ‘norm’ of political life. Thus, in the language of the Copenhagen School, a securitizing move occurs when an issue not previously thought of as a security threat comes to be produced as such via a speech act that declares an existential threat to a referent object (Buzan et al 1998). A similar logic can be identified in approaches to security that focus on exceptionalism: the idea, following the paradigmatic thought of Carl Schmitt, that sovereign practices rely upon the decision to suspend the normal state of affairs in order to produce emergency conditions in which extraordinary measures—such as martial law, for example—are legitimised. For this reason, a tendency in security studies—even among self-styled ‘critical’ approaches – is to privilege analysis of high-profile ‘speech acts’ of elites, ‘exceptional’ responses to ‘exceptional’ circumstances, and events that are deemed to be ‘extraordinary’. Arguably this leads to an emphasis on what we might call the ‘spectacle

of security’, rather than more mundane, prosaic, and ‘everyday’ aspects of security policy and practice.

By contrast, the world of CIs necessitates a shift in the referent object of security away from the ‘spectacular’ to the ‘banal’. Instead of high-profile speech-based acts of securitization, we are here dealing with telecommunications and transportation networks, water treatment and sewage works, and so on: ‘semi-invisible’ phenomena that are often taken-for-granted fixtures and fittings of society, yet vital for the maintenance of what is considered to be ‘normal daily life’. For this reason our subject matter calls for a re-thinking of the very ‘stuff’ considered to be apposite for the study of international security. Indeed, analysing the role of CIs and resilience planning in global security relations adds particular resonance to existing calls within the literature to broaden and deepen the way in which acts of securitization are conceptualised (Bigo 2002; Balzacq 2005; McDonald 2008; Williams 2003). Those adopting more sociologically-oriented perspectives, for example, have sought to emphasise the way in which securitizing moves can be made by institutions (as well as individuals), through repeated activity (as well as one-off ‘acts’), and involve various media (not only ‘speech’, but visual culture, for example). From this reconfigured point of view it is possible to then see how the design, planning, management, and execution of CIs also constitute an arena in which processes of securitization—of physical and cyber networks—takes place.

As well as pushing the referent object of security beyond the ‘spectacle’ of high-profile speech acts, the study of CIs prompts a further methodological question about what resources exist for the analysis of ‘material’ phenomena. Arguably the prominence of the ‘speech act’ as a theoretical device for studying securitization is a reflection of the legacy of the so-called ‘linguistic turn’ in social and political theory, which came to impact upon security studies—

along with the broader disciplines of Politics and International Relations of which it is a sub-field—from the late 1980s. Much of the literature associated with the linguistic turn in social and political theory (Shapiro 1981, Der Derian 1987, Shapiro and Der Derian 1989, Campbell 1992, Connolly 1993) relied on ‘discourse’ as a key methodological as well as theoretical tool. However, in contrast to a widespread and rather misleading assumption, ‘discourse’, for these authors, did not only concern texts and words in a strictly linguistic sense (Lundborg and Vaughan-Williams, forthcoming). Rather, these authors sought to invoke a much broader and more expansive conception of discourse, which also included the general ‘context’ in which linguistic phenomena acquire their meaning. In order to study and analyse such a context it is necessary to look beyond mere texts and words, and take into account material things and objects, including, for example, photographs, toys, spatial configurations, material objects, and virtual representations, etc.

While more expansive treatments of discourse beyond a narrow linguistic focus have existed for quite some time, it is not until recently that ideas about how to actually incorporate the role of materiality in the analysis of discourse have started to appear. For example, a small but growing number of theorists in political anthropology (Navro-Yashin, 2009), political philosophy (Bennett, 2004), and International Relations (Coward, 2009) have recently argued for the incorporation of non-linguistic phenomena in political analysis generally. This work stresses that materiality *exists* – as a force, a spatial arrangement, an element in relations of power, and an object of knowledge – next to and alongside language and the linguistic realm. It exists, moreover, not as a passive background or object, whose content and meaning can be captured, represented, or constructed by language, but rather as something that is both *active* and *alive*.

Jane Bennett (2004, 2010) has developed what is arguably the clearest and also most radical take on materiality as a non-linguistic force in contemporary political theory. Materiality, according to Bennett, should not simply be reduced to something passive, the meaning of which is either represented or constructed by humans. Rather, materiality can be said to express a ‘life force’ of its own. In this way, by trying to dissolve the traditional life-matter binary, the ‘life force’ to which Bennett refers is not some kind of ‘spiritual supplement’ that enters an already existing physical body. Rather, it belongs to the affective quality of the material thing *itself*. Thus, rather than positing ‘a separate force that can enter and animate a physical body’, ‘life force’ is equated with the materiality of the thing or object *as such* (Bennett 2010, xiii). Referring to the ‘force of things’ along these lines, Bennett contests the common assumption that ‘*things* are always already humanized *objects*’ (2004, 357), and that, in accordance with a historical materialist-perspective, the force of materiality only can be grasped in relation to a social and economic context. Nor can its value or meaning be fully determined by humans. The nonhuman, according to Bennett, should not automatically be reduced to the human. Challenging the anthropocentrism that dominates much of contemporary political theory, Bennett argues that it is important to maintain some kind of distinction between them – in order to explore what things actually *do*, what kinds of effects they generate, but also to allow ‘nonhumanity to appear on the ethical radar screen’ (2004, 357). Drawing upon Bennett’s thing-power approach the next section explores how the political force of materiality can be used as a key analytical tool for analysing the enhancement and protection of CIs in the US.

US Critical Infrastructure

The US vision for the enhancement of CIs can be found in *The National Plan for Research and Development in Support of Critical Infrastructure Protection* (hereafter ‘The Plan’) from 2004. The Plan refers to ‘the high vulnerability of America’s infrastructures and the severe consequences of protecting them’ (DHS 2004: 1). The Plan was a direct outcome of a Presidential directive on *Critical Infrastructure Identification, Prioritization, and Protection*, signed by President George W. Bush in December 2003 (Homeland Security Presidential Directive/Hspd-7). The main purpose of this directive was to update the overall goals and strategic aims for CI protection (CIP) in light of the attacks of 11 September, 2001, and in accordance with the USA Patriot Act. According to the directive:

Critical infrastructure and key resources provide the essential services that underpin American society. The Nation possesses numerous key resources, whose exploitation or destruction by terrorists could cause catastrophic health effects or mass casualties comparable to those from the use of a weapon of mass destruction, or could profoundly affect our national prestige and morale. In addition, there is critical infrastructure so vital that its incapacitation, exploitation, or destruction, through terrorist attack, could have a debilitating effect on security and economic well-being.

The importance of CIs for national security as well as for the image of US national identity is well illustrated here, not least by referring to the wide-ranging effects of a potential terrorist attack on national prestige and morale. Against that backdrop, The Plan has come to play an extremely important role in laying the foundations for a US national CIP-strategy.

Undergirding this strategy are three stated long-term goals: to develop i) a national common

operating picture for CI; ii) security systems ‘designed-in’ to next-generation communication networks; and iii) resilient, self-diagnosing, and self-healing physical and cyber infrastructure systems (DHS 2004: viii). In order to achieve these goals The Plan enjoins federal, state, and local government, together with the private sector, and ‘concerned citizens across the country’, to help protect ‘national security, economic vitality, and the American way of life’ (DHS 2004: 1).

One crucial and interesting aspect of The Plan’s long-term goals is linked to resilience planning and the idea that CI systems should be able to self-heal and survive *independently* of human interference. In this respect The Plan recommends the development of ‘next-generation infrastructural concepts, architectures and systems, both physical and cyber, to include designed-in and built-in security’. Moreover, it states that these systems ‘must become reliable, autonomic (self-repairing and self-sustaining), resilient, and survivable in order to continue to operate in diminished capacity rather than failing in crisis conditions’ (DHS 2004: xi). CIs should thus have the capacity to act, adapt, survive, and even spring back to life *after* an attack, and *without* human interference. In the context of ‘physical infrastructure’ this might for example involve developing and producing more advanced materials ‘that self-heal fractures, have extreme strength, or that can deform and absorb energy but then go back to their original shape’ (DHS 2004: 14).

From a vital materialist perspective the *objects* of CIs play a crucial role here, not because they are controlled and managed by human subjects but rather because of the ways in which they actively *participate* in the control and management of flows. With the capacity to spring back to life and survive catastrophic damage without human interference it is as if the objects of CIs take on a life of their own. The ‘matter’ of the materials should therefore not be

viewed as fixed or static but rather as constantly evolving and self-surviving. The latter process might not be discernable to the human eye; it might belong to a life-world outside and independently of human perception. It might belong, for example, to intelligent computer systems that can mutate and thereby repair themselves, or to intelligent and adaptive power grids designed to absorb and regenerate energy. The electrical grid, for example, can be thought of as a highly complex network that generates, controls, and distributes electricity over vast areas. It includes, among many other things, electromagnetic fields, power plants, city networks, computer programmes, each of which play their own particular role in the control and management of electricity.

Due to the complexity of the network it is, however, impossible to control in detail the exact behaviour of electricity flows, or to fully predict in which directions these flows will travel. As Bennett (2010: 28) notes: 'Electricity sometimes goes where we send it, and sometimes it chooses its path on the spot, in response to the other bodies it encounters and the surprising opportunities for actions and interactions that they afford.' The bodies to which Bennett refers can all be linked to the 'lifeworld' of the power grid. It is a lifeworld that includes human elements (lifestyles, profit motives, fantasies of mastery, companies, buyers, power plants, members of Congress who decide on the rules for energy companies), as well as nonhuman things (electron flows, heat, water, wires). Using the example of the 2003 North America power blackout, which affected approximately 50 million people, Bennett explains why it is so important to take into account the forces of humans, things, and the interplay between them. It is important because it was the frictions among the different elements of the grid – between, for example, energy companies, politicians, electrons, wires – that created the extreme 'dissonance' and internal collapse of the system (2010: 25).

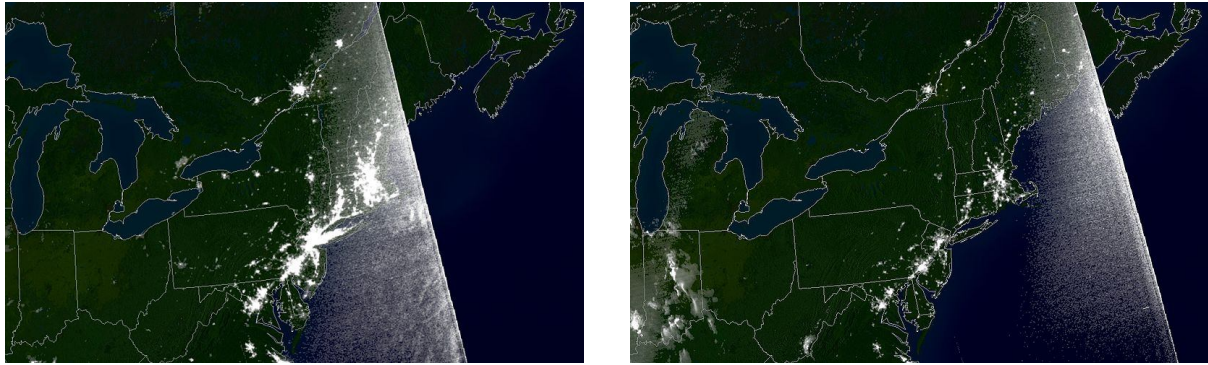


Figure 1.

National Oceanic and Atmospheric Administration (NOAA) satellite imagery one day before and the night of the blackout.

The complex mix or ‘assemblage’ of things – human as well as nonhuman – that made up the lifeworld of the electrical grid suggests that the power blackout cannot merely be explained by pointing to human errors. Taking into account the complex assemblage of the grid it is necessary to move beyond a traditional anthropocentric notion of human agency, which gives priority to the ‘intentions’ of human subjects. A more fruitful direction here is to adopt a vital materialist perspective and posit the materialist forces underpinning the human-nonhuman assemblage of the grid as the main reference point. For Bennett: ‘An assemblage owes its agentic capacity to the vitality of the materialities that constitute it’ (Bennett 2010: 34). On this basis it is possible to analyse the power blackout in relation to the lifeworld of the assemblage and the complex interplay of human as well as nonhuman forces. This does not mean, then, that human intentions are unimportant. It means, rather, that if human intentions are to be taken seriously they must be situated next to other forces, some of which are human and some of which are nonhuman. In the interplay between them things happen, events occur, but without being reducible to a single cause or action. Their emergence can be linked to a variety of different movements, some of which may not even appear to have any purpose or

meaning at all, and some of which may be guided more by chance than anything else.

According to Bennett, this is at least partly what the 2003 blackout of the grid ‘is’ telling us.

The interplay between human and nonhuman forces, people and technology, is also illustrated by the expansive view put forward by The Plan of what ‘vital infrastructure’ might mean:

‘CIs are not just buildings and structures—they include people and physical and cyber systems that work together in processes that are highly interdependent’ (DHS 2004: 2). On this view, CIs include key nodes (such as industrial complexes, airports, control and communication centres, power plants, locks, dams, and farms) as well as equally important interconnecting links (transportation systems, utilities, the internet). The ‘agency’ of these nodes and links, then, can be connected with the complex assemblages of human and nonhuman forces, which interact but which in the final instance cannot be subordinated to a specific purpose or telos. And yet this is precisely what The Plan proposes as it envisions the possibility of a purpose, telos, and even a particular type of behaviour among CIs. Thus, while the DHS acknowledges that CIs are highly complex systems, comprising human and nonhuman elements, physical and cyber networks, and the sometimes unpredictable interplay between them, it also articulates as one of its main goals the creation of a ‘system of systems’ – a system through which all other CI systems can be controlled and managed (DHS 2004: 2). And the main idea underpinning the notion of such a system is the capacity of all CIs, their individual components, and the interplay between them, to be resilient, self-healing and able to spring back to life after serious damage, without having to rely on human actions. Consider for example the nine different themes of CIP listed in The Plan (figure 2.), showing how different potential threats are imagined, and how to counter them through a ‘Resilient, Self-Healing, Self-Diagnosing Infrastructure’.

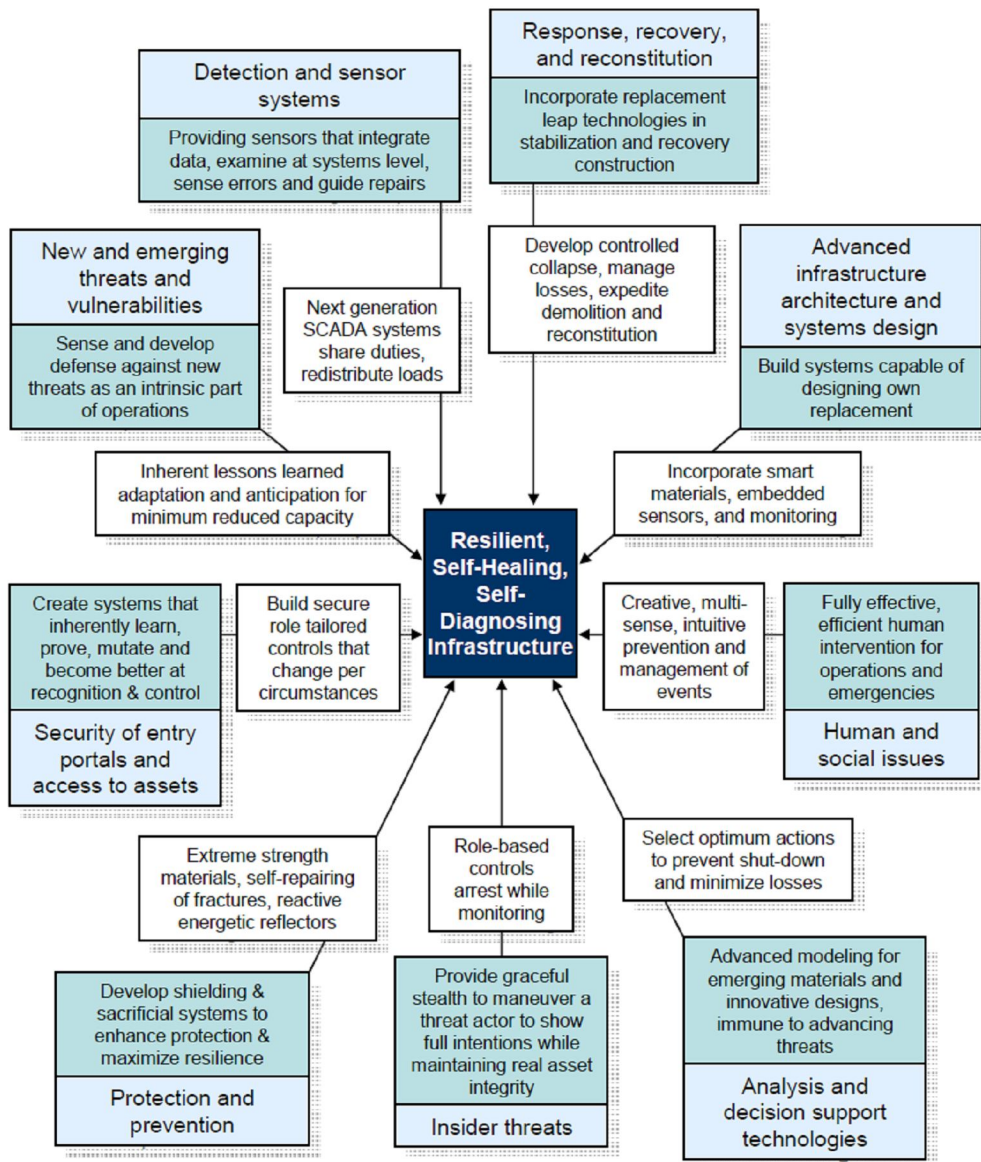


Figure 2

‘Illustration of how each theme, the future capabilities developed in the theme, and some example R&D tasks help achieve the strategic goal of inherently resilient infrastructure’

(DHS 2004: 19).

The very idea of a resilient, self-healing and self-diagnosing infrastructure hints at the near obsession with CIP in the West and in the US in particular. In the next section we look at how it might be possible to analyse the broader political stakes of this obsession with reference to recent prominent biopolitical problematisations of CIs.

The Biopolitics of CIs and Resilience Planning

While much of the existing literature on CIs and resilience planning has been of a policy nature, two notable exceptions are contributions by Lentzos and Rose (2009), and Dillon and Reid (2009). What distinguishes these contributions from other extant work is their critical insistence on questioning the broader political stakes of the Western obsession with CIs and resilience planning. Both locate this questioning within a biopolitical horizon inspired by the work of Michel Foucault.

Lentzos and Rose (2009) seek to address the issue of how the political rationalities of advanced liberal democracies have become replaced by new technologies animated by the *telos* of security. In other words, they take as their starting point a curiosity about the nature of the contemporary relationship between governance in the West and security: a curiosity that Foucault had already begun to develop in his series of lectures at the College de France published recently as *Society Must Be Defended* (2004). Lentzos and Rose cite Foucault's animating distinction between *centripetal* disciplinary mechanisms on the one hand and *centrifugal* biopolitical apparatuses on the other. The former isolates and closes off space in order to regulate bodies within that given area; the latter, by contrast, works *with* movements in ever-wider circuits in order to manage complex realities.

In recent years a number of authors have worked with and developed Foucault's insights about how security can be made compatible with circulation in this way (Amoore 2006; Bigo 2007; Salter 2006). As such it is unnecessary to rehearse these relatively well-known arguments here, except to stress, as Lentzos and Rose do, that what is valued in liberal democratic societies is precisely the ability to keep people, services, and goods constantly on the move. The necessity to maintain these centrifugal forces therefore takes the analysis of security practices beyond simple (disciplinary) notions of prevention, 'big-brother' style surveillance, and barricades. Instead, biopolitical apparatuses of security are shown to work with complexity, embrace and identify patterns in flows, and govern through management of these dynamics.

It is within this context, then, that Lentzos and Rose situate what they call a 'logic of resilience', understood as 'a systematic, widespread, organizational, structural and personal strengthening of subjective and material arrangements so as to be better able to anticipate and tolerate disturbances in complex worlds without collapse' (Lentzos and Rose, 2009: 243). On this view, therefore, resilience encompasses technologies of security that recoil from shocks to (and within) the 'system of systems' they constitute in order to ensure a return to 'normal' conditions of circulation as quickly as possible.

While working within the same Foucauldian-inspired biopolitical paradigm, Dillon and Reid (2009) examine more specifically the role of resilient CIs in securing what they call the 'liberal way of rule'. Before exploring their treatment of CIs in this context, it is first necessary to introduce aspects of their broader argument about the relationship between liberalism and war. They begin by characterising liberalism as a 'systemic regime of [...] power relations', which, although committed to peace-making, is nevertheless marked by an

equal commitment to war, continuous state of emergency, and constant preparedness for conflict (Dillon and Reid 2009: 7). From their perspective, war and society are mutually constitutive and the liberal way of rule can be understood as: ‘a war-making machine whose continuous processes of war preparation prior to the conduct of any hostilities profoundly, and pervasively, shape the liberal way of life’ (Dillon and Reid 2009: 9). As such, the liberalism-war complex acts as a grid for the production of knowledge, preoccupations, and political subjectivities.

Taking their lead from Foucault’s later work, Dillon and Reid argue that the basic referent object of liberal rule is *life itself*. From this perspective the liberal way of rule/war is inherently biopolitical: ‘its referent object is biological being and its governmental practices are themselves, in turn, governed by the properties of species existence’ (Dillon and Reid 2009: 20). Dillon and Reid stress, however, that the properties of species existence are not givens, but rather subject to changes in power/knowledge. Over the last 20 years the Revolution in Military Affairs (RMA), accompanied by developments in the life sciences, has changed the way that life is viewed and understood.

The move to ‘informationalise’ life has led to the reduction of what it means to be a living being to a code, and as a result: ‘the very boundaries which long distinguished living from not living, animate from inanimate and the biological from the non-biological have been newly construed and problematised [...]’ (Dillon and Reid 2009: 22). The corollary of this account is that the informationalisation of life has, in turn, changed the way in which war is waged by liberal rule:

The development of the life sciences in general, and of complexity science in particular, comprising new knowledge about the complex emergent adaptive processes and properties of open living systems, has transformed the ways in which liberal regimes have come to understand that very nature of war, and of the relation to war to complex adaptive evolutionary models of rule and order. The military is as interested now [...] in life-creating and life-adaptive processes as it is in killing, because, like the liberal way of rule and war more generally, it locates the nature of the threat in the very becoming-dangerous of the vital signs of life itself (Dillon and Reid 2009: 111-2).

In other words, development in the life sciences has been embraced by liberal regimes, which, in turn, has affected the way that they view and fight wars. The move in life sciences away from Newtonian physics to complexity has enabled new biopolitical technologies of governance. Complexity science stresses the ‘anteriority of radical relationality’, the ‘dynamic and mobile nature of existence’ and the ‘contingencies of bodies-in-formation’ (Dillon and Reid 2009: 72). Liberal biopolitical rule takes these problematisations of life as a starting point for securing its own existence. Thus, in a development of Foucault’s account of biopolitics as ‘making live and letting die’, Dillon and Reid argue that liberalism only promotes the kind of life that is productive for its own enterprise in the light of new power/knowledge relations.

A liberal biopolitical problematisation of life entails security practices that can ‘preempt the emergence of life forms in the life process that may prove toxic to life’ (Dillon and Reid 2009: 87). For these reasons, as set out in the lengthy quotation above, the perceived nature of threats has changed along with the emergence of alternative problematisations of life.

Threats are no longer viewed as straightforwardly actual, but what Dillon and Reid refer to as ‘virtual’: ‘the very continuous and contingent emergency of emergent life as being-information; becoming-dangerous’ (Dillon and Reid 2009: 44). To put it differently, the threat with which liberal biopolitics is obsessed is the *potentiality* of some life to become dangerous and therefore detrimental to what living should involve. It is in this context that Dillon and Reid uncover a paradox of liberalism: the fact that according to its own logic it needs to kill in order to make life live.

Dillon and Reid deal with both aspects of this biopolitical/necropolitical logic. Their discussion of the liberal way of war explores the various ways in which killing takes place, the aporia accompanying universal justifications of it, and the lethal criteria by which politics is reduced to mere ‘animal husbandry’ (Dillon and Reid 2009: 104). What is more pertinent to the purposes of the present paper, however, is the equally significant account they offer of attempts by liberal rule to make life live:

If the vocation of biopolitics is to make life live, it must pursue that vocation these days by making life live the emergency of its emergence ever more fully and ever more resiliently, detailing, clarifying, amplifying and otherwise drawing out the entailments of the emergency in the effort to make life live even more animatedly in both virtual and actual terms (Dillon and Reid 2009: 89).

It is in this context that we return more explicitly to the role of resilient CIs because it is precisely these material apparatuses through which liberal rule secures the way of life it needs to reproduce its vision of ‘correct living’ and also, therefore, the authorisation of its own

authority. Dillon and Reid pick up on Foucault's inversion of Clausewitz's famous aphorism—'politics is the extension of war by other means'—to argue that the liberal peace is extended throughout society via CIs. They claim it is no coincidence that since 9/11 CIs have become reified as referent objects of securitization. Strategically and symbolically, CIs perform vital roles in securing the liberal way of rule and its vision of what 'quality of life' must mean:

[...] the defence of critical infrastructure is not about the mundane protection of human beings from the risk of violent death at the hands of other human beings, but about a more profound defence of the combined physical and technological infrastructures which liberal regimes have come to understand as necessary for their vitality and security in recent years (Dillon and Reid 2009: 130).

On this basis, Dillon and Reid extend the biopolitical diagnosis of resilience offered by Lentzos and Rose. Not only is resilience about the design and management of the 'system of systems' in such a way as to enable a smooth and expeditious return to 'normal' conditions. More importantly, resilient CIs are also necessary for the optimisation of virtual (i.e. pre-emptive) tactics against the becoming-dangerous of bodies in-formation: tactics upon which the edifice of liberal rule ultimately rests. Moreover, Dillon and Reid shrewdly observe that the perception of 'terrorist threat' in Western societies enables liberal regimes to further develop and entrench CIs, in turn extending and intensifying biopolitical control over life.

While the biopolitical perspective offers some extremely important insights into the political stakes of and near obsession with CIs and CIP in the West, it is also possible to highlight

some potential problems of this approach. Our main concern that we wish to express here can be linked to what Coleman and Grove (2009) have recently referred to as a trend among many critical social analysts to use the concept of biopolitics as a ‘catch-all’ term.

Both Lentzos and Rose (2009) and Dillon and Reid (2009) share a tendency to present the biopolitical system they diagnose as a closed, totalising, and deterministic machine. In addition, there is a curious absence of critical reflection on the historical and geographical specificities of different types—and therefore effects—of ‘liberal’ rule. It is unclear from these analyses precisely where the boundary between ‘liberal’ and ‘illiberal’ governance is presumed to lie or on what grounds it might be identified as such. How, for example, are we to distinguish European fascisms of the 1930s—arguably the paradigmatic examples of biopolitical orders—from ‘liberal’ forms of government in Western Europe today? Further still, ‘liberal rule’ is taken to be a fully-formed mode of governance and the tacit assumption is that the network of biopolitical power relations ‘it’ entails actually ‘works’.

Although Dillon and Reid hint at the excess of life over the reduction of species existence to information (2009: 56), the thrust of their account treats ‘liberal biopolitical rule’ as a fully-constituted—and ‘successful’—totality. At no point in their account, for example, are there any illustrations of where the power relations instantiated by liberal biopolitical rule break-down, or, following a Foucaultian logic, produce subjectivities who resist their subjectification and/or desubjectification.

By contrast, we want to suggest that resilient CIs and the edifice they seek to protect are far more open-ended, unpredictable, and faltering than these accounts otherwise imply. This is significant, we will argue, because it highlights cracks in the ‘system of systems’, which are

precisely sites for resistance, contestation, and a reminder that life is always already more than simply 'code'.

From 'Molar' to 'Molecular' Security

In this section we add an additional layer to the biopolitical problematique outlined and applied to the analysis of CIs by Lentzos and Rose (2009) and Dillon and Reid (2009). To do so we seek to resist the idea of a totalising biopolitical structure and instead point to the instability and unpredictability of resilient CIs as fundamentally open and often dysfunctional systems. In this regard it is instructive to revisit Bennett's work on the 'life force' of materiality.

Adopting a vital materialist perspective, Bennett is very careful *not* to develop an analysis in which a totalising structure ultimately determines the force of things. Rather, by emphasising the vital materialities underpinning the movement of bodies – human as well as nonhuman, people as well as technology, the animate as well as the inanimate – it is precisely the uncertain and unpredictable interplay of different forces that must be explored. Consequently, from her perspective it is also necessary to reject the notion of a superior and totalising structure, since such a structure would automatically subordinate all forces and life movements to a particular telos or overarching goal.

As Bennett notes, a 'structure' is 'unable to give the force of things its due: a structure can act only negatively, as a constraint on human agency, or passively, as an enabling background or context for it' (Bennett 2010: 29). In other words, to impose the notion of a superior, totalising structure is to neglect the potential forces that reside in the materiality of things – forces that can produce unpredictable outcomes and strange effects. One such outcome,

which was referred to earlier in the paper, was the 2003 electrical power blackout. It was noted how the electrical power grid expresses a lifeworld of its own, in which different forces interact. Crucially, there is no totalising structure within the lifeworld of the grid – no ‘system of systems’ that can determine the exact behaviour and movement of electricity. The latter depends on a complex and unpredictable assemblage in which various forces – nonhuman as well as human – interact. Referring to a superior and totalising structure in this context would thus be highly misleading, since no such structure could possibly account for the uncertain and unpredictable interaction of forces, which lead to the power blackout.

Problematising the notion of a superior, totalising structure, and appreciating the ‘life force’ of materiality implies, furthermore, that the notion of ‘life’ in the biopolitical problematique also has to be reconsidered. In the previous section it was noted how Dillon and Reid argue that the liberal biopolitical rule only promotes the kind of life that is productive for its own enterprise, and that the threats with which it is concerned refer to the ‘potentiality’ of some life to become dangerous and therefore detrimental to what living ‘should’ involve. It is for this reason that liberalism paradoxically can be characterized as an extremely violent mode of governance that is prepared to ‘kill’ in order to ‘make life live’. In this context, then, ‘life’ refers not just to something expendable, but also to something controllable, calculable, and adaptable within the biopolitical machine. Hence, while acknowledging the unpredictability and contingency of life – as something that may always ‘become’ dangerous and emerge as a threat – Dillon and Reid rely on a rather limited notion of what ‘life’ may actually refer to; their analysis is limited to a mere concern with a form of life that is forced to obey and adapt within the biopolitical system.

From a vital materialist perspective the narrow conception of 'life' as something controllable and adaptable within a particular system becomes very problematic. Not only does it run the risk of diminishing the role that vital materialities might play in provoking the movement of bodies – human as well as nonhuman – in ways that are often unpredictable. It also unnecessarily delimits our understanding of 'life', what 'life' consists of, and how 'life' might express itself in contemporary political practice and resilient CIs. Hence, one way to challenge the notion of a closed, totalising structure or biopolitical system is to work with a broader notion of life, in order to include another layer that is not simply referring to what is adaptable and controllable within the biopolitical machine but is in excess of that apparatus.

The molar and the molecular: two modes of composition

In order to problematise the idea of life as something controllable and adaptable we invoke Gilles Deleuze and Félix Guattari's concepts of the 'molar' and the 'molecular', which, in crude terms, can be understood as two different modes of composition.

Whereas the 'molar' refers to a rigid composition, organised around fixed borders and identities, the 'molecular' highlights a more open mode of composition, characterized by fluctuating boundaries and uncertain identities. These two modes of composition can be applied to a variety of phenomena, such as, for example, material objects, spatial arrangements, institutions, classes, gender, and so on. Regardless of what is being referred to a 'molar' composition will always consist of separate, rigid segments, each of which has an identity and a territory, and can in some sense be calculated and controlled.

Referring to Henry James's novella 'In the Cage', Deleuze and Guattari give the following example:

The heroine, a young telegrapher, leads a very clear-cut, calculated life proceeding by delimited segments: the telegrams she takes one after the other, day after day; the people to whom she sends the telegrams; their social class and the different ways they use telegraphy; the words to be counted. Moreover, her telegraphist's cage is like a contiguous segment to the grocery store next door, where her fiancé works. Contiguity of territories. And the fiancé is constantly plotting out their future, work, vacations, house. Here, as for all of us, there is a line of rigid segmentarity on which everything seems calculable and foreseen, the beginning and end of a segment, the passage from one segment to another (Deleuze and Guattari 2004: 215).

The notion of the 'molar' in this context refers both to the ways in which people and things are organised into separate and well-defined segments – telegrams, days, people, classes, words, etc – and to the ways in which the order of these segments and the relationships between them can be calculated and foreseen. Each segment is assumed to have a particular function and follow a certain, repeatable pattern – one telegram after another, day after day, word after word, the time for vacations, the time work, and so on. Moreover, even though the segments are different it is precisely their mode of composition – *as* molar segments – that makes them fit together and operate next to one another, side by side. 'I am a man, you are a woman; you are a telegraphist, I am grocer; you count words, I weigh things; our segments fit together, conjugate' (Deleuze and Guattari 2004: 216).

As a rich couple comes into the post office, however, the young woman is suddenly introduced to a completely different set of segments: multiple coded telegrams that are signed with pseudonyms, which point to something completely other than the mere repetition of what she is used to. The telegrapher learns that the male customer has a secret that places him in serious danger and an entire ‘life’ outside the ordinary routines is suddenly revealed to the woman:

In relation to this man, directly with him, the young telegraphist develops a strange passionate complicity, a whole intense molecular life that does not even enter into rivalry with the life she leads with her fiancé’ (Deleuze and Guattari 2004: 216).

There is something about the secret that introduces a strong sense of doubt, and makes it difficult to know who is who, or what anything means. Identities and meaning are thereby dissolved by the secret, and next to the molar compositions of fixed, calculable, controllable segments, there are *molecular* flows, fluctuating boundaries, and open wholes.

It is important to emphasise that for Deleuze and Guattari, the molar and the molecular do not exclude one another, but exist side by side as two different albeit complementary layers.

Whereas the molar refers to a life that can be calculated and controlled in accordance with a particular pattern, system or structure, the molecular points to the existence of a life outside the given forms of any particular system. In Deleuze and Guattari’s vocabulary, the molecular introduces us to an uncertain, unpredictable, and indefinite *becoming*—rather than ‘being’—of life. This molecular becoming is much closer to Bennett’s version of a vital materialism than to Dillon and Reid’s analysis of the liberal biopolitical rule.

While of course they have very different aims with their respective analyses, Dillon and Reid, on the one hand, refer to ‘becoming’ only in the context of a totalising structure in which life may always ‘become’ dangerous and therefore must be coded into risk categories. Bennett, on the other hand, provides a much broader conception of becoming, which signals an indefinite movement that always has the potential to resist the codes and categories that are imposed upon it by a particular system or structure. In this way, whereas Dillon and Reid operate mainly at the level of the ‘molar’, Bennett is more interested in the ‘molecular’.

It might be counter-argued that Dillon and Reid purposefully seek to diagnose the apparatus of liberal biopolitical rule *as* a molar attempt to capture life. In this sense theirs can be read as an immanent critique of that rule. Yet what this misses are precisely the molecular complexities to which Bennett’s approach implies. The next section, therefore, discusses the implications of taking the molecular layer of life seriously for the analysis of resilient CIs and the management of populations. In particular, we explore what happens when the idea of a totalising structure is replaced by an open, complex, and interdependent system, in which things do not always work the way they are meant to.

The molecular composition of CI: Strange outcomes, absurd realities, molecular becomings

The move we seek to make from the molar to the molecular in our analysis of resilient CIs is best illustrated with some examples of the many ‘mistakes’, ‘mishaps’, and ‘backfires’ generated by the systems designed to pre-empt future terrorist attacks, together with moments of resistance against those systems.

Child suicide bombers

Our first example relates to the US government's terrorist watch-list, which is designed to detect and prevent terrorist suspects from entering as well as travelling within US territory. The list has been used at airports in order to stop potential terrorists from passing the security checks and boarding any planes. Based on a vast amount of databases, which contain electrically stored personal information and draw upon various security agencies' data records, the list has in many instances proven to be far from 'accurate'.

Javaid Iqbal, a 7-year old boy from the UK, was repeatedly stopped at airports on his journey to a family holiday in Orlando, Florida. Accompanied by his parents, the boy was detained and questioned about his identity in Manchester and Philadelphia on suspicion of being a suicide bomber. It later emerged that he shared the same name of a 39-year old Pakistani man arrested 2 months after the attacks of September 11, 2001. Although the man was never charged with any terrorism-related offences, his name was nevertheless held on the watch list of suspicious travellers with which the boy's movements became mistakenly correlated at a US flight-data analysis centre. Speaking of his ordeal, Javaid said: 'All this was about my name. They said that it had a block on it. We felt scared and didn't know what was going on' (Evening Standard, 2007).

In a similar way, 4-year old US citizen Edward Allen was stopped from boarding a plane in Houston, Texas as his name popped up on the same terror watch list. Edward's mother spoke about their bizarre experience: 'They just said, "You're on the list" and that's why I had to get clarity [...] I asked if we're both on the list. They said, "No, you're not on the list. He (Edward) is"' (quoted in ABC news 2005). She added that: 'Anytime he has to travel, he will always be stopped and he might not be able to travel, not until you get him special clearance.'

While he cannot get off the list because his name will always match that of a terrorist suspect, his mother explained that it would also be extremely difficult to get a special clearance for him since, due to his young age, he lacks the necessary identification forms to get the clearance.

Once the terror watch-list has started to target suspicious travellers it is very difficult to reverse the outcomes generated by the system. The people involved, in these cases the airline company, the airport security personnel, the children and their parents, can only follow the established procedures for dealing with ‘terrorist suspects’, do what the machines tell them, and obey. Even though the system – and the interaction of human and nonhuman forces, people and technology, man and machine upon which it relies – has produced strange outcomes in terms of targeting two young boys, there is nothing that automatically will stop it from producing similar outcomes. That is the absurdity of the system; the mistakes generated by it are integral to the system itself.

Terrorist targets: from petting zoos to flea markets

Another example of the absurdity of CIs and the strange outcomes produced by them can be linked to the federal anti-terrorism database or National Asset Database (NADB). The NADB was produced by the DHS as part of its mission to protect CIs and key resources (KR) in line with the Presidential Directive on *Critical Infrastructure Identification, Prioritization, and Protection* referred to earlier. DHS uses the list to ‘map’ the day-to-day intelligence against all listed assets.

In a report from 2006, the DHS Office of Inspector General (OIG) reviewed the work that the DHS had done in establishing the NADB. At its commencement in 2003 the list contained

160 nationally critical assets. As of January 2006 this figure had grown to 77, 069, most of which were submitted by individual states to the DHS. According to the OIG, guidance given to each state was very vague, which partly explains the ‘abundance of out-of-place assets now in the NADB whose criticality is not readily apparent’ (DHS 2006: 9). Examples of such assets are provided in the table below (Table 1).

Old MacDonald’s petting zoo	Mall at Sears
Bean Fest	Nix’s Check Cashing
Amer. Society of Young Musicians	Trees of Mystery
Car Dealerships	Kennel Club and Poker Room
Historical Bok Sanctuary	4 Cs Fuel and Lube
DPW Landfill	Kangaroo Conservation Center
Assyrian American Association	[state] Right to Life Committee
Association for the Jewish Blind	[university] Insect Zoo
Bourbon Festival	Theological Seminary
Jay’s Sporting Goods	Nestle Purina Pet food Plant
Auto Shop	Veterinary Clinic
Groundhog Zoo	Sweetwater Flea Market
High Stakes Bingo	Petting Zoo
[state] Community College	[a] Restaurant
Frontier Fun Park	[a] Travel Stop
Mule Day Parade	Beach at End of [a] Street
Amish Country Popcorn	[a] Pepper and Herb Company

Table 1

‘Examples of Out-of-Place Assets, ODP [Office for Domestic Preparedness] 2003 Data Call’

(OIG 2006: 11)

The list of potential terrorist targets highlights the absurdity of apparatuses designed to protect CIs. Since the list of assets is used to ‘map’ day-to-day intelligence, vast resources are used to monitor a large number of seemingly irrelevant targets, such as the Mule Day Parade, Old MacDonald’s petting zoo, the Amish Country Popcorn factory, and an unspecified Beach at the End of a Street.

According to the OIG, 'having more assets may obscure desired data, making such prioritizations more difficult. Additionally, assets that will never be used in an analysis will have to be filtered out repeatedly' (DHS 2006: 10). The OIG also highlights a peculiar variation between states in terms of their views of what might count as a potential terrorist target. This variation becomes very clear when considering the number of assets listed for each state, which does not seem to make much sense at all:

Indiana lists 8,591 assets in the NADB, more than any other state and fifty percent more than New York (5,687). California has 3,212 assets, fewer than 7 other states including Nebraska (3,457), Wisconsin (7,146), and Indiana (8,591)' (DHS 2006: 14).

While agreeing that the DHS should provide states with better directions in their data calls, Jarrod Agen, a DHS spokesman, said: 'We don't find it embarrassing. [...] The list is a valuable tool' (quoted in Lipton 2006). Angela McNabb, manager of the Sweetwater Flea Market, located 50 miles from Knoxville, Tenn, disagreed: 'I don't know where they get their information. We are talking about a flea market here' (quoted in Lipton 2006). Sen. Charles Schumer, Democrat of New York concurred: 'Now we know why the Homeland Security grant formula came out as wacky as it was. [...] This report is the smoking gun that thoroughly indicts the system' (quoted in Lipton 2006). Thus, in one of his characteristically satirical remarks on *The Daily Show*, Jon Stewart commented on the fact that the list of potential terror targets included amusement parks and miniature golf courses: 'Apparently Al Qaeda is downgrading its mission statement from 'Destroy America' to 'Ruin an 8 year-olds' birthday party'.

While the vagueness of the data calls surely played an important role in producing some of the peculiar outcomes of the terrorist target list, ideas about what constitutes a ‘terrorist target’ or indeed a ‘national asset’ in the first place were also crucial. On the one hand, including places such as the Petting Zoo, the Fort Wayne Roller Dome, and an unspecified Travel Shop fails to make much sense. But, on the other hand, when considering the Homeland Security hysteria—and the near obsession with protecting CIs after the attacks of September 11—it may not appear that clear to everyone what the category of a ‘potential terrorist target’ is ‘supposed’ to refer to.

This uncertainty may very well be connected with the growing sense of fear that anyone *could* be a potential enemy (as illustrated by the cases of Javaid Iqbal and Edward Allen), and that another attack *could* potentially occur at any place and at any point in time. In this sense the war on terror has produced a strong sense of fear and uncertainty over the nature and location of threats and enemies. As is evident in *The Plan*, this uncertainty is illustrated not least by the R&D plans for resilient CIs, which should be prepared for literally *any* kind of potential scenario, including one in which ‘a trusted party who has passed all controls, is inside key assets, and proceeds to do harm’ (DHS 2004: 15).

Resisting molar subjectification

What the examples above illustrate so powerfully are the manifold ways in which biopolitical attempts to categorise and filter different forms of life become un-worked according to their own logic. This molecular un-working of the system from within is otherwise obscured, however, if a molar composition is privileged and taken as an unproblematised entity that

‘works’. A privileging of the molar is also insensitive to specific contexts in which biopolitical power relations produce subjects that often contest—rather than obey—various forms of subjectification and desubjectification. Such contestation is one aspect of the politics of CIs and resilience that is noticeably absent in molar biopolitical accounts offered by Lentzos and Rose (2009) and Dillon and Reid (2009).

One illustration of the multiple sites of resistance against liberal biopolitical rule via CIs can be identified in the context of border security practices. Since 9/11 ‘the border’ has come to play an increasingly important role in Western governments’ CI and resilience planning. Under conditions where national security imperatives are presented as responding to an almost permanent state of emergency, borders between states have become ever more sophisticated, pre-emptive, and as mobile as the subjects, services, and goods they seek to control. As such, borders are not only located at the outer-edge of the state, but to be found increasingly throughout states’ territories as part of their CI and resilience against ‘attack’ from threats that are no longer straightforwardly associated with the ‘outside’.

Such bordering practices are not, however, without contestation. A prominent example of resistance to Western border security practices in recent years is the phenomenon of public protests against deportations on flights out of Europe. One such case is that of Franco La Cecla, an Italian anthropologist, who, together with two unnamed Frenchmen, resisted the forceful deportation of a Congolese migrant to Senegal on an Air Horizon charter flight from Paris Charles de Gaulle airport in December 2004. According to Statewatch, La Cecla was seated in front of the migrant and two policemen who were accompanying him. The Congolese man was reportedly in distress, crying and trying to get up from his seat. Eyewitnesses claim he was gagged, slapped, and his head was forced against La Cecla's seat and then pushed to the floor. La Cecla and two others complained to the Captain and

demanded to be let off unless the migrant was released. Under pressure from passengers the migrant was escorted off the plane by the two policemen, but La Cecla and the other protesters were arrested, held and questioned for 19 hours, and had their fingerprints taken (Statewatch 2005). Thus, while the apparatuses of security ultimately turned on those who protested, this example demonstrates that biopolitical attempts to govern through circulation not only back-fire but are resisted by subjects that refuse to be complicit in those forms of governance.

Conclusion

In contrast to the overarching impression given by Lentos and Rose (2009) and Dillon and Reid (2009), resilient CIs are not totalising and infallible systems of biopolitical control. Rather, it is important to recognise that they are prone to fail, breakdown, and back-fire according to their own logic, and meet with resistance from subjects who struggle to evade capture. The examples of the no-fly lists and the terror target list illustrate what sometimes appears to be strange outcomes and absurd realities, created by remote-control security apparatuses designed to sort through and filter out ‘dangerous’ life from ‘productive’ life. The lists are absurd not least when viewing it from the perspective of a liberal biopolitical rule. If, indeed, the aim of such form of governance is to make life live by controlling the movements of bodies and using violent and discriminatory practices to do so, how can it be said to benefit from including the petting zoo or the roller dome in the terror target list?

By focusing on the strange outcomes, absurd realities, and moments of resistance produced by systems designed to secure CIs and the way of life they are in turn designed protect, a molecular layer of uncertainty can be detected and introduced to the analysis. What this shift away from the molar indicates is that objects, places, people may not be what they previously

appeared to be. There is an underlying, unspecified ‘secret’, which, just like in Henry James’s novel, reveals the existence of something other than the mere repetition of the same everyday routines that can otherwise be mistaken for established, settled, and unproblematic structures. Indeed, the secret reveals a molecular life in which identities and meaning are increasingly blurred, and in which it is sometimes difficult to know who is who, or what anything means.

On this basis, the terrorist watch-list, target list, and acts of resistance can all be linked to the interplay between human and nonhuman forces referred to by Bennett – between computer programs, ideas about terrorism, fantasies of destruction, the materiality of the assets, and the affects generated by them. These material assemblages produce molecular layers of life that undermine the coherence, consistency, and predictability of the molar ‘order of things’.

While the fantasy of molar biopolitical logics may be all-too readily detectable in the context of the war on terror, a recovery of the molecular composition of security practices reminds us that these logics are only ever *attempts* at producing and securing life in particular ways. The recovery of the molecular thus serves as an important reminder that life is more than biopolitical code, and that, alongside an insistence on highlighting some of the most insidious encroachments into civil liberties and methods through which life is increasingly controlled, it is also necessary to mark the puerile and absurd dimensions to these practices.

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