Resilience, Critical Infrastructure, and Molecular Security: The Excess of "Life" in Biopolitics[1]

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This article investigates the political significance of the orientation of Western security relations around critical infrastructure (CI) and resilience planning. While the analysis is located in the International Political Sociology literature, it departs from recent biopolitical accounts of CIs and resilience. These accounts tend to present such apparatuses as closed, totalizing, and inevitably "successful" modes of governance. Rather, we argue that resilient CIs are open, vulnerable, and often absurd systems that continually falter, backfire, and often undermine themselves according to their own logic. By developing what we call a "molecular security" approach, we draw attention to the way in which life constantly evades capture. In this sense, we suggest, there is always an excess of "life" in biopolitics.

In recent years, Western governments have invested significantly in the enhancement of critical infrastructures (CIs). One prominent 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 defense 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.[2]

Of course, the provision and maintenance of adequate CIs is not a "new" phenomenon, nor one confined to the "West" (Duffield 2011). Rather, CIs are associated with the quintessence of statehood both historically and globally.

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[2] See, for example, the "European Programme for Critical Infrastructure Protection" (2005) and the UK "Sector Resilience Plan for Critical Infrastructure" (2010).

Nevertheless, what is arguably significant about recent efforts to enhance CIs 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 struck multiple blows precisely at the heart of essential (and highly symbolic) financial and transportation networks vital for the ''continual flow of information, goods and services.''

Alongside investment in CIs has emerged the concept of ''resilience'' around which current security planning, design, policy, rhetoric, and practice increasingly revolves. Here resilient CIs are commonly understood in terms of systems that demonstrate the ''ability... to withstand and recover from adversity'' (Sir Michael Pitt, quoted in Cabinet Office 2010:7). In this context, metaphors of ''recoiling,'' ''bouncing back,'' and ''returning to normal'' abound.[3]

The inter-disciplinary study of CIs and resilience planning is developing 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 2007 special issue 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, Ljungkvist, Boin, and Rhinard 2007).

Elsewhere, 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 political 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 do CIs and resilience planning reveal assumptions about contemporary political life in the West?[4]

In this article we tackle these questions in light of recent developments in the field of International Political Sociology (IPS). Reflecting ongoing efforts in IPS to re-theorize practices of (in)securitization, the first section considers what is at stake in the move to focus on material apparatuses, rather than states or individual ''speech-actors,'' as referent objects in the field of global security relations. Drawing chiefly on the work of Jane Bennett, we advance an approach that recovers what we call the ''political force of materiality'' after the so-called linguistic turn in social and political theory.

The second section outlines in further detail key developments in CI and resilience planning with especial focus on the paradigmatic US case. 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 United States's vision of homeland security.[5]

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[3]For a recent genealogy of the concept of resilience see Walker and Cooper (2011).

[4]Two recent exceptions are Aradau (2010) and Lakoff and Collier (2010).

[5]While there have been subsequent updates, including the 2010 joint Canada-US initiative, we focus on the original Plan as a landmark in the trajectory of CI and resilience planning globally.

We deploy a vital materialist perspective influenced by Bennett to analyze the ways in which the *objects* of CIs do not form part of an inert backdrop for practices of (in)securitization, but are *themselves* active in the management of flows in order to attempt to ensure ''resilient'' outcomes.

The third section then seeks to address the broader political stakes of the Western obsession with resilient CIs by drawing on recent biopolitical analyses of the ''logic of resilience'' offered by Lentzos and Rose (2009) and ''infrastructures of liberal living'' by Dillon and Reid (2009). While to some extent agreeing with the critical purchase of these perspectives, however, we ultimately argue that it is necessary to go further in recognizing that CIs are not closed, totalizing, and inevitably ''successful'' biopolitical apparatuses. Instead, we want to argue that they must be seen for what they are: open, vulnerable, and often absurd systems that continually falter and backfire, and are often undermined according to their own logics.

Finally, in the fourth section we consider 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 Gilles Deleuze and Félix Guattari's theorization of ''molar'' and ''molecular'' orders of composition in order to develop a new register—''molecular security''—for analyzing the fluctuating boundaries, uncertain identities, and material life produced by resilient CIs. Using illustrative examples set in the context of US counter-terrorism practices, we ultimately argue from a molecular security approach that life always exceeds biopolitical attempts at controlling and capturing ''it.''

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, Wæver, and de Wilde 1998). A similar logic can be identified in approaches to security that focus on exceptionalism: the idea, following 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 legitimized. For this reason, a tendency in security studies—even among some 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. Indeed, it is precisely the importance of the quotidian dimension of global security relations that an IPS perspective has sought to emphasize in recent years (Bigo 2008).

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, here we are dealing with telecommunications, transportation, and financial networks, water treatment and sewage works, electricity, and so on: semi-invisible phenomena that are often taken-for-granted as the fixtures and fittings of society, yet nonetheless 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, analyzing the role of CIs and resilience planning in global security relations adds particular resonance to existing calls within the IPS-related

literature to broaden and deepen the way in which acts of securitization are conceptualized (Bigo 2002, 2008; Williams 2003; Balzacq 2005; McDonald 2008).

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 discipline of International Relations (IR) of which it is largely a subfield—from the late 1980s. Much of the literature associated with the linguistic turn in IR (Shapiro 1981; Der Derian 1987; Der Derian and Shapiro 1989; Campbell 1992; Connolly 1993) relied on ''discourse'' as a key methodological as well as theoretical tool. However, ''discourse,'' for these authors, did not only concern texts and words in a strictly linguistic sense. Rather, they invoked a more expansive conception of discourse to include the general ''context'' in which linguistic phenomena acquire their meaning.

While such treatments of discourse have thus existed for quite some time, only recently have ideas about how to incorporate materiality in discursive studies of politics become popular. A small but growing number of theorists in political anthropology (Navaro-Yashin 2009), political philosophy (Bennett 2004, 2010; Braun and Whatmore 2010; Coole and Frost 2010), and IR (Coward 2009; Aradau 2010; Duffield 2011; Walker and Cooper 2011) have argued for the incorporation of nonlinguistic 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. 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*.

According to Bennett (2004, 2010), materiality expresses a ''life force'' of its own: the affective quality of the thing *itself*. Rather than positing ''a separate force that can enter and animate a physical body,'' the notion of the ''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) or that the force of materiality only can be grasped in relation to a social and economic context as per an historical-materialist perspective. Nor can its value or meaning be fully determined by humans: the nonhuman, on Bennett's view, should not automatically be reduced to the human. Challenging the anthropocentrism that dominates much of contemporary political theory, she argues that it is important to maintain a 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).

While stressing the importance of exploring the vitality and potentiality of the nonhuman, the form of ''naive realism,'' ''onto-story'' or ''ecology of matter'' that Bennett seeks to develop also emphasizes the need to examine ''ways in which human being and thinghood overlap'' (2004:349). Thus, alongside accounting for what things actually *do*, it is also necessary to explore the interaction or interplay between the ''human'' and the ''nonhuman.'' Indeed, an important theme running throughout not only Bennett's work but much of the literature associated with the so-called materialist turn in political theory is the notion that a clear line between the ''human'' and the ''nonhuman'' *cannot* be easily drawn and maintained. In this sense, one of the main assumptions underpinning this literature is that materiality is always already implicit in the production and ongoing formation of what we commonly refer to as ''human.'' Hence, the materiality of the nonhuman is not something that supplements an already existing human entity: ''The human body and its capacities emerge as such in

relation to a technicity that precedes and exceeds it: there is no body, no original body, no origin outside this relation; no thinking, no thought, no logos, without that which forces thought'' (Braun and Whatmore 2010:xix). On this view, it is necessary to consider how materiality is imbued in the network of relations that constitutes the human–nonhuman interaction, which is precisely what we seek to do in our treatment of the contemporary politics of CIs and resilience planning.

"The Plan": A Vital Materialist Analysis

The US vision for the enhancement of CIs was first articulated in *The National Plan for Research and Development in Support of Critical Infrastructure Protection* (2004) (hereafter ''The Plan''). The Plan was a direct outcome of the 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 Critical Infrastructure Protection (CIP) in light of the attacks of September 11, 2001, and in accordance with the USA Patriot Act. The importance of CIs for national security as well as for the image of US national identity is well illustrated by this directive, not least by referring to the wide-ranging effects of a potential terrorist attack on national prestige and morale. Against this 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 even 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 programs, each of which play their own particular role in the control and management of electricity. Following Bennett, there is a "lifeworld" of the power grid—a world 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).

The complex mix or "assemblage" of things—human as well as nonhuman—that made up the life-world 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. Within this assemblage, 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 centers, 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, in the final instance, cannot be subordinated to a specific purpose or *telos.* Yet this is precisely what The Plan proposes as it envisions the possibility of a purpose and even a particular type of behavior 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). 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. Indeed, the very idea of a resilient, self-healing, and self-diagnosing infrastructure hints at the near obsession with CIP in the West (and the United States in particular), which raises the key question: What are the broader political stakes of this obsession?

The Biopolitics of CIs and Resilience Planning

While much of the existing literature on CIs and resilience planning has been of an explicitly policy-oriented nature, two notable exceptions are Lentzos and Rose (2009), and Dillon and Reid (2009). What distinguishes these contributions from other work is their critical insistence on questioning the political significance of 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 Collège 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; Kavalski 2009; 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 the management of these dynamics.

It is within this context 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 also working within the 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, it is first necessary to introduce aspects of their broader argument about the relationship between liberalism and war.

Dillon and Reid begin their book by characterizing 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 this 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 proper-
ties of species existence'' (Dillon and Reid 2009:20). They 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,
accompanied by developments in the life sciences, has changed the way that life
is viewed and understood.

The move to ''informationalize'' life has led to the reduction in 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 problematized...'' (Dillon
and Reid 2009:22). The corollary of this account is that the informationalization
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 of war to complex adaptive evolutionary models of rule and order.
> (Dillon and Reid 2009:111)

> 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 2009:125)

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 problematizations of life as a start-
ing 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 enter-
prise in light of new power/knowledge relations.

A liberal biopolitical problematization of life entails security practices that can
''pre-empt 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 problematizations 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 emergence of life as being-infor-
mation; 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 for our purposes, 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 live life 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 it even more animatedly in both virtual and actual terms. (Dillon and Reid 2009:89)

It is in this context that we can 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 authorization 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 optimalization of virtual (that is 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 threats'' in Western societies enables liberal regimes to further develop and entrench CIs, in turn extending and intensifying biopolitical control over life.

While a biopolitical perspective offers some important insights into the political stakes of and obsession with CIs and resilience planning in the West, it is also possible to identify some potential problems with this approach. Our main concern connects with Coleman and Grove's (2009) identification of a trend among some critical social analysts to use the concept of biopolitics as a ''catch-all'' term. Both Lentzos and Rose (2009) and Dillon and Reid (2009) present the biopolitical system they purport to diagnose as if it were a closed, totalizing, and deterministic machine. ''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 do hint at the excess of life over the reduction in 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 breakdown. By contrast, we want to suggest that resilient CIs and the biopolitical edifice they seek to protect are far more open-ended, unpredictable, and faltering than these accounts otherwise imply.

From Molar to Molecular Security

Here we seek 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 resist the idea of a totalizing biopolitical structure and point to the instability and unpredictability of resilient CIs as fundamentally

open—and often dysfunctional—systems. In this regard, we find it instructive to first revisit Bennett's conceptualization of the ''life force'' of materiality.

From a vital materialist perspective, Bennett is careful *not* to develop an analysis in which a totalizing structure ultimately determines the force of things. Rather, by emphasizing 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 she argues deserves critical exploration. Consequently, from Bennett's perspective, it is also necessary to reject the notion of a superior and totalizing 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, totalizing 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, referred to earlier, is the case of 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, in this example there is no totalizing structure within the lifeworld of the grid—no ''system of systems'' that can determine the exact behavior and movement of electricity. The latter depends on a complex and unpredictable assemblage in which various forces—nonhuman as well as human—interact. 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.'' Referring to a superior and totalizing structure in this context would be highly misleading, since no such structure could possibly account for the uncertain and unpredictable interaction of forces, which led to the power blackout.

Bennett's problematization of the notion of a superior, totalizing structure and her appreciation of the life force of materiality calls for a radical reconsideration of what ''life'' itself refers to in the biopolitical problematique. Earlier we noted that for Dillon and Reid liberal biopolitical rule only promotes the form of life that is productive for its own enterprise. On their view, the concern of such rule is the ''potentiality'' of some life to become dangerous and therefore detrimental to what living ''should'' involve according to the liberal paradigm. It is for this reason that liberalism, paradoxically, can be characterized as a 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, Dillon and Reid rely on a rather limited notion of what ''life'' may actually refer to—as something that may always ''become'' dangerous and emerge as a threat. Consequently, their analysis is reduced to a concern with a form of life that is forced to obey and adapt within the biopolitical system.

Following Bennett, the narrow conception of ''life'' at play here is highly problematic. First, it runs the risk of diminishing the role that vital materialities play in provoking the movement of both human and nonhuman bodies in ways that are often unpredictable. Second, it also unnecessarily delimits our understanding of ''life,'' what ''life'' consists of, and how ''life'' might express itself in response to contemporary political practice and resilient CIs. Hence, one way to challenge the notion of a closed, totalizing biopolitical system is to work with a much broader notion of life, in order to include another layer that is not simply

referring to what is adaptable and controllable, but that which is radically in *excess* of the biopolitical machine.

The Molar and the Molecular: Two Modes of Composition

In order to problematize the idea of life as controllable and adaptable, we turn to Deleuze and Guattari's concepts of the ''molar'' and the ''molecular,'' which, in crude terms, can be understood as two different modes of composition. These modes can be applied to a variety of phenomena, such as, for example, material objects, spatial arrangements, institutions, classes, gender, and so on.

On the one hand, the ''molar'' refers to a rigid composition, organized around fixed borders and identities. Regardless of what is being referred to, ''molar'' compositions always consist of separate, rigid segments, each of which has an identity and a territory, and can in some sense be calculated and controlled. Each segment is assumed to have a particular function and follow a certain, repeatable pattern. 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.

On the other hand, the ''molecular'' highlights a more open mode of composition characterized by fluctuating boundaries and uncertain identities. In this register, segments do not fit together neatly, but overlap or fall apart. Any sense of repetition or familiarity is disrupted and a secret molecular ''life'' of flows is revealed. In Deleuze and Guattari's vocabulary, the molecular thereby introduces us to an uncertain, unpredictable, and indefinite *becoming*—rather than ''being''—of life. Following such a process, one cannot simply turn into something static or definite, for example a woman, an animal, an adult, a terrorist. There is only ever a *constant* process of becoming, a becoming that eludes any ''molar'' categorizations:

> Yes, all becomings are molecular: the animal, flower, or stone one becomes are molecular collectivities, haecceities, not molar subjects, objects, or form that we know from the outside and recognize from experience, through science, or by habit. If this is true, then we must say the same of things human: there is a becoming-woman, a becoming-child, that do not resemble the woman or the child as clearly distinct molar entities… (Deleuze and Guattari 2004:303)

Whereas the molar refers to a life that can be calculated and controlled in accordance with a particular pattern, system or structure, by contrast the molecular points to the existence of a life that eludes the given forms of any particular system. In this way, the register of the molecular embraces what Deleuze and Guattari refer to as ''materiality's power of variation'': the power of materiality to flow within as well as between the human and nonhuman and thereby alter different forms of becoming within an open set of relations.

Applying this argument, we might say that Dillon and Reid's analysis tends to focus on the molar composition of liberal biopolitical rule, whereas Bennett's version of vital materialism is much closer to Deleuze and Guattari's notion of molecular flow. While of course they have very different aims in their respective analyses, Dillon and Reid, on the one hand, refer to ''becoming'' only in the context of a totalizing 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 of rule or structure of control.

It might be counter-argued that Dillon and Reid purposefully seek to diagnose the apparatus of liberal biopolitical rule precisely *as* a molar attempt to capture life. In this sense, theirs can be read as an immanent critique of that rule, but this would be to miss the molecular complexities that Bennett's approach implies. By contrast, we seek to embrace the molecular layer of life insisted upon by Deleuze and Guattari and explore what happens when we treat resilient CIs not as totalizing structures, but open, complex, and interdependent systems, in which things do not always work the way they are supposed to.

The Molecular Composition of "Resilient" CIs: Strange Outcomes, Absurd Realities, Molecular Becomings

The move we want 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.

Child Suicide Bombers

Our first example concerns the US government's terrorist watch list, designed to detect and prevent terrorist suspects from entering as well as traveling within US territory. This list is a vital aspect of the DHS' CI used most notably at international airports in order to stop potential terrorists from passing security checks and boarding planes. Based on vast databases containing electrically stored personal information, as well as various security agencies' data records, the list has nevertheless in many instances proven to be far from ''accurate.''

For example, Javaid Iqbal, a 7-year-old boy from the United Kingdom, 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 offenses, his name was held on the watch list of suspicious travelers with which the boy's movements became mistakenly correlated at a US flight-data analysis center. 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 Edward Allen 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 clearance.

Once the terror watch list begins to target suspicious travelers, it is very difficult to reverse the outcomes generated by the system. The people involved, in these cases the airline companies, the airport security personnel, the children, and their parents, can only follow the established procedures for dealing with ''terrorist suspects'' by obeying what the machines tell them to do. 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 precisely 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 identified in relation 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 in line with the Presidential Directive on *Critical Infrastructure Identification, Prioritization, and Protection* referred to earlier. The DHS uses this 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 Table 1.

This 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:

TABLE 1. Examples of Out-of-Place Assets, ODP [Office for Domestic Preparedness] 2003 Data Call (DHS 2006:11)

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
Bourbon Festival	[university] Insect Zoo
Jay's Sporting Goods	Theological Seminary
Auto Shop	Nestle Purina Pet food plant
Groundhog Zero	Veterinary Clinic
High Stakes Bingo	Sweetwater Flea Market
[State] Community College	Petting Zoo
Frontier Fun Park	[a] Restaurant
Mule Day Parade	[a] Travel Stop
Amish Country Popcorn	Beach at End of [a] Street

> 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 seven 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, Tennessee, disagreed: ''I don't know where they get their information. We are talking about a flea market here'' (quoted in Lipton 2006). Senator 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-old's 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, as did local security agencies' efforts to attract as much federal funding as possible, 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 Stop fails to make much sense. But, on the other hand, when considering the Homeland Security hysteria—and the near obsession with protecting resilient 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).

The absurd outcomes of the terrorist watch-list and target list 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, wishes to acquire more funding, the materiality of the assets, and the affects generated by them. These human–nonhuman assemblages produce molecular layers of life, which go beyond and have the potential to undermine the coherence, consistency, and predictability of the molar ''order of things'': resilient CIs are never complete, but open and vulnerable systems. Indeed, this crucial point highlights a constitutive *aporia* that characterizes resilient CI systems and the structuring of global security relations around them: as Western societies in particular become ever more reliant on such systems they simultaneously become more vulnerable not only to external attack but also the effects of their own unpredictability.

Conclusion: A Molecular Security Approach

Shifting the register of analysis from molar to molecular yields a number of significant outcomes that challenge extant ways in which we study not only resilient CIs, but practices of (in)securitization to which they relate more generally.

First, a molecular frame posits a radically relational ontology, which encourages greater sensitivity toward the active role that material forces play in the composition of contemporary social and political life. The stuff that is part of our everyday milieu of interaction shapes behaviors, conditions the possibility of different outcomes, and is performative of different types of subjectivities. Moreover, the shared reliance on access to CIs indicates their vital function in reproducing certain forms of life and communities based around those visions. For this reason, CI and attempts to securitize it must be read as performing a political role in the fashioning of global security relations.

Second, thinking in terms of the molecular politics of resilience and CIP challenges molar conceptions of such systems as totalizing, infallible structures of biopolitical control. The examples of the grossly inaccurate no-fly list and absurd terror target lists illustrate that far from being resilient these systems are prone to fail, breakdown, and back-fire according to their own logic. These ''failures'' are of course ''successful'' in the Foucauldian sense as they reproduce the need for better resilience, more investment in technology, and enhanced attempts to securitize facets of life. However, a molar orientation remains blind to such dynamics and their effects.

Third, taking the power of materiality's variation seriously involves heightened awareness of the role of nonhuman forces in various ''becomings.'' For example, the production of the children as terrorist suspects on their journeys to the US from Europe was a direct result of automated risk assessments rather than human immigration officials. In turn this prompts the need for greater critical reflection on the role that *technē* plays in the (re)production of sovereign lines between those who are deemed worthy to be mobile on the one hand, and those cast outside as risks and thereby rendered immobile on the other.

Finally, the molecularization of the study of resilient CIs does not imply the abandonment of molar categorizations, positions, and perceptions. Deleuze and Guattari insist that the two modes of composition are not posited in a zero-sum relation to each other. Rather, a molecular approach works alongside molar registers by complicating them, destabilizing their attempts at creating coherence, and challenging the totalizing horizons that they represent. For the purposes of this article, this serves as a significant reminder that while the fantasy of molar biopolitical logics may be all-too readily detectable in the context of the war on terror, these logics are only ever *attempts* at producing and securing life in particular ways. Life is more than code: there is always an *excess* of life in biopolitics.

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