

Environmental Terror:
Uncertainty, Resilience and the Bunker

Mark Duffield

University of Bristol

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School of Sociology, Politics and International Studies

University of Bristol

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Mark Duffield is currently Professor of Development Politics at the University of Bristol and Director of the Global Insecurities Centre. He has taught at the Universities of Khartoum, Aston and Birmingham and held Fellowships and Chairs at Sussex, Leeds and Lancaster. Duffield is currently a member of the Scientific Board of the Flemish Peace Institute, Brussels and a Fellow of the Rift Valley Institute, London and Nairobi. Outside of academia, during the 1980s, he was Oxfam's Country Representative in Sudan. Duffield has advised government departments including DFID, EU (ECHO), the Swedish Ministry of Foreign Affairs, and the Swedish International Development Cooperation Agency (SIDA); also NGOs such as CAFOD, International Alert, Comic Relief and Oxfam; and UNICEF, UNOCHA, UNDP and UNHCR. His books include *Global Governance and the New Wars: The Merging of Development and Security* (2001) and *Development, Security and Unending War: Governing the World of People* (2007).

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Abstract

Total war is usually understood as the blurring of erstwhile political distinctions among people, armies, and government. It is more than this. Total war is a modus operandi involving the destruction—from the cellular to the planetary—of an enemy’s environmental life-world. Working through uncertainty and surprise, total war presents itself as environmental terror. Through the concept of resilience, this essay examines environmental terror in the practices of civil defence and how, when harnessed to liberal critiques of modernity, this terror has been generalized in the current all-hazard turn in national security. The uncertainty that lies at the heart of environmental terror calls forth the bunker as a site of defence and the strategization of power. In light of the bunker’s military origins, the spatial propagation of the bunker is traced in the growing polarization between public and private urban space. Reflected in the gated communities, green zones, fortified aid compounds, shopping malls, and tourist enclaves of the global city, bunkers offer sites of elite refuge, private consumption, and a secure base from which power, in an uncertain and divided world, can be strategized without negotiation.

In recent years, how liberal states view national security has changed significantly. Concerns with more traditional external military threats from hostile states have receded. In their place, national security now focuses on a raft of new and diverse enemies ranging from terrorism, fragile states, infrastructure collapse, pandemics, biodiversity loss and natural disasters to the all-encompassing security nexus of climate change (Cabinet Office 2008; WEF 2010). Rather than the state and its military capacity as such, these largely non-state, transnational and social-ecological threats impact upon society and people's lives from the cellular to the planetary: national security has expanded to embrace life in its totality (Rockstrom *et al* 2009). Given the comprehensive reshaping of life-world habits now deemed necessary to confront these interconnected threats, this paper considers the changed perception of national security from the perspective of rethinking total war. That is, from a blurring of distinction between governments, peoples and armies to a society-wide mobilisation against an environment increasingly experienced as terroristic. With the ending of the Cold War – and with it a real chance of societal extinction – this terror has, paradoxically, called forth a security apparatus that sees in the very neurological processes, engineered infrastructures, ecological systems and social networks that together make life possible, a reflection of its own limits, inner vulnerabilities and ultimate demise (Evans 2010; Virillo 2008).

The paper begins with an examination of environmental terror as a *modus operandi* of war that targets the totality of an enemy's supporting life-world. Originating in the Twentieth Century phenomenon of total war, environmental terror was explicated through a growing dialogue and increasing indistinction between war, nature and economy. Working through uncertainty and surprise, a key response to environmental terror has been the emergence of technologies of resilience. Breaking with modernist conceptions of social protection that are based upon knowing and protecting against the future through statistically derived forms of insurance, resilience positively embraces uncertainty and the ultimate unknowability of the future. An organism, an individual, an eco-system, a social institution, an engineered infrastructure, even a city – in fact, anything that is networked, evolving or 'life-like' in some way – is now said to be resilient in so far as it able to absorb shocks and uncertainty, or reconfigure itself in relation to such shocks while still retaining its essential functionality (Holling 1973; 2008). The paper explores the genealogy of resilience in the civil defence measures pioneered to survive nuclear attack, departures in ecology that broke with equilibrium-based models of range management and echoing developments in neoliberalism (Cooper & Walker 2010). Besides an adaptive resilience, however, the rise of environmental terror has also seen the appearance of a more spatial and defensive technology: the bunker. With origins in the military bunker, but now offering economic, political and cultural elites spaces of private refuge and consumption, in various forms and existing at different scales, the bunker has become neoliberalism's signature urban architectural form.

Environmental terror

Associated with the World Wars of the Twentieth Century, especially WWII, total war is usually understood as the breakdown of earlier juridical distinctions between people, governments and armies (van Crevelde 1991). These distinctions had earlier shaped the rules of war that protected people by ideally confining war, at least in Europe, to battles

between comparable armies. The blurring of such differences was premised upon the industrialisation of war. During the Twentieth Century, whether as soldiers, workers or mothers, entire societies were directly mobilised for war. Rules and restraint evaporated as societies fought to the death in support of contrary world-views and moral systems. The burning cities, extermination camps, huddled refugees and mushroom clouds of WWII provide the iconic images of total war. Where total war is seen as relevant today, it is usually in relation to understanding the pathologies of the developing world. For some, the global South is now "...the *locus classicus*" of total war (Ibid: 58). Destructive civil wars, ethnic cleansing, systematic human rights abuse and violent excess mark its (geographically limited) continuation. Such views underpin, for example, the influential 'new war' thesis (Kaldor 1999) and have provided post-Cold War liberal interventionism with much of its moral justification (Boutros Ghali 1992). We need to redress this Eurocentric and partisan view of total war, not only returning it to the beating heart of the developed world but also exposing its intrinsic expansionism from cellular life to the planetary level.

Total war embodies the essence of terrorism. Rather than simply a blurring of juridical distinctions flowing from the industrialisation war, it involves a particular *modus operandi* of violence available to those with the technology to fabricate it. In this respect, the year 1915 is significant. In the context of WWI, it marks the first offensive use of chlorine gas against an opposing army (Sloterdijk 2009) and, in the form of the Zeppelin raids, the beginning of the aerial bombardment of urban centres (Meilinger 1996). These were elemental departures in Europe from the erstwhile 'crossing of swords' by equally matched armies. Indeed, the body of the enemy soldier itself was no longer the direct target of war. The objective was now the environment, in this case the atmosphere and urban infrastructure, which sustained enemy life. Targeting an enemy's environmental life-world is "...the basic idea of terrorism in its more explicit sense" (Ibid: 14). Thus, terrorism "...can only be understood when grasped as a form of exploration of the environment from the perspective of its destructibility" (Ibid: 28). As a terroristic *modus operandi* total war involves "...an attack on the enemy's primary, ecologically-dependent vital functions: respiration, central nervous regulations, and sustainable temperature and radiation conditions" (Ibid: 16). From this beginning environmental weapons of mass destruction have multiplied. Besides poison gas, they include blanket bombing, designer fire-storms, radiation weapons, biological pathogens, asphyxiation bombs and, more recently, attempts to geo-engineer weather patterns, alter the properties of the ionosphere and control outer-space for military purposes (Ibid; Peoples 2008; Gilbert 2004).

As a systematic act of terrorism designed to destroy the life-world of the enemy, total war must be understood in its expansive totality as environmental terror. It is more than a blurring of the distinctions between people, governments and armies. While the latter is juridically important, as a *modus operandi* environmental terror constitutes an interconnected whole. Its possibilities run from the ruination of the body's physiological, neurological and psychological functions by the manipulation of its sensory surroundings, through to the destruction of life's supporting urban infrastructures together with their vital ecosystems and climate regimes. Environmental terror moves seamlessly from the cellular to the planetary. Originating as WWI's essential thought this totality forms a battle-terrain that interconnects and blurs the individual as a living organism with the metabolic urban infrastructures that

covert nature into commodities and services (Swyngedouw 2006). Terrorism expunges and degrades life both directly through lethally changing the body's surrounding atmosphere and indirectly by acting on society's critical economic, organisational and ecological systems. While 'precision' weapons may be used to destroy vital technical infrastructure within this essentially urbicidal framework of de-modernisation (Campbell, Graham and Monk, 2007), for the unborn, young, old and sick, the loss of these life-support systems represents a recurring and cumulative death dwarfing in numbers the original 'collateral damage' and lasting years after the event; especially when, as in the Gaza Strip and Iraq following the first Gulf war, sanctions are used to deliberately prevent reconstruction (Graham 2010).

The military implications of gas and aerial bombing paved the way for the explication of the environment as an object of study. Air and atmosphere, for example, became dedicated areas of investigation and discovery in law, medicine, science, politics and aesthetics "...in response to their terrorist deprivation" (Sloterdjick 2009: 25). The reformulation of total war as environmental terror took place through the growing dialogue between war, economy and nature. This dialogue, especially since WWII, has helped produce the contemporary social-ecological understanding of life. This involves not only the interdependence between social and natural systems, but the claim that the application of complex, emergent and non-linear behavioural discoveries in the latter can be used to understand the former (Folke 2006). In supporting this dialogue, 'resilience' now operates as a *lingua franca* of risk, preparedness and survivability across the physical, natural and social sciences (Cooper & Walker 2010). The explication of the environment as terroristic has not only collapsed conventional nature-society and human-nonhuman distinctions (Swyngedouw 2006), it has also blurred the traditional dichotomies between the national-international and internal-external as well (ipp 2008). Environmental terror is a radically permissive terrain. Indeed, it has collapsed and dissolved the oppositional categories and prohibitions once axiomatic of modernity "...to the point of entering into a real zone of indistinction" (Agamben 1998: 4). This blurring is symptomatic of capitalism now finding its current and perhaps final limit in the environmental life-world of planetary existence itself.

The spatial and ecological turn

The appreciation of the ecological nature of capitalism, that is, as a spatial and circulatory arrangement of interdependent and information-exchanging vital systems, developed with the growing urban concentration of population made possible by the reliance on coal during the nineteenth century as the main energy supply. At the turn of the Twentieth Century a vast transportation network had emerged in the USA and Europe moving "... concentrated carbon stores from the underground coal face to the surface, to railways, to ports, to cities and to sites of manufacturing and electrical power generation" (Mitchell 2009: 403). Frequently initiated by coalminers, the spontaneous ability of mass strikes to spread contagiously through the close-coupled national coalmining, railway and dock industries was a feature of this period. The mass strike as a political weapon emerged out of the narrowing mesh of capitalism's expanding circulatory and urban metabolic infrastructure. Writing in 1906, Rosa Luxemburg was aware of the organic, unpredictable and contagious nature of the mass strike (also see Foucault on Iran in Afary & Anderson 2005). Usually originating in local grievances and at a time when strike action was not curbed by law, independent of political direction

the mass strike had the wild ability to circulate capriciously throughout capitalism's strategically networked national trades and industries. With its origins constantly shifting and rejuvenating, with new possibilities and perspectives opening as old ones closed, it flows "...now like a broad billow over the whole kingdom, and now divides into a gigantic network of narrow streams; now it bubbles forth from under the ground like a fresh spring and now is completely lost under the earth" (Luxemburg 1906: ChIV, para 2; also see Mitchell 2009). During WWI, in the US and UK, the coal and rail industries were placed under direct government administration. Spurred by the Russian Revolution, during the early 1920s, bourgeois fears of a possible 'triple alliance' between coal, rail and dock workers were rife. This concern was grounded in the stranglehold these workers could potentially wield over capitalism's national vital systems and energy supply. These fears called forth visions of "... power which, once exercised, would paralyze the . . . nation more effectively than any blockade in time of war. (Ibid: 405, quoting Mackenzie King 1918, former Canadian Minister of Labour)¹.

Emerging out of the experience of WWI, strategic bombing doctrine amplified the premonition of infrastructural vulnerability into an environmental terror to be unleashed on enemy society. In so doing, it would further explicate the ecology of urban systems. The need to prioritise targets that would produce mass-effects like the destruction of political morale (Anderson 2010), called forth a new form of "economic intelligence" that required a particular knowledge detailing "...an enemy's habits of life, mentality, political system, economic apparatus, transportation systems, commodities flow, etc" (Meilinger 1996: 264, quoting Air Commodore Ludlow-Hewitt, 1928). Strategic bombing doctrine invoked a new way of looking at society and economy. Society became a catalogue or cartographic tour of infrastructural targets, such as, armament factories, electricity stations, sewage plants, coal mines and workers' housing, all interlinked by such essential arteries as telephone exchanges, railways, canals and bridges. Building on Luxemburg's metaphor of streams and rivers, it broke with conventional social and economic concepts, like class and manufacturing output, to see economy and society logistically and spatially. The economy became an ecological network of interconnected parts, each exchanging information, goods and services, which together maintained the psychological and political morale, and hence the military capability, of the nation. At stake in the dialogue between war, economy and nature that environmental terror has orchestrated, is capitalism's ever deepening experimental exploration of the biological, social and economic limits imposed by the environment, and how far these limits can be pushed and transgressed (Cooper 2008). This is driven by the martial imperative to understand how society's critical infrastructure functions ecologically, how it metabolises nature, and how the whole radically networked global social-ecological system connecting the cellular to the planetary can be attacked and defended (Reid 2006).

Latency and dual-use

A central part of environmental terror's totalising expansiveness, is the issue of environmental latency and dual-use. Rather than the specially fashioned weapons and

¹ Mitchell (2009) points out how these fears gave rise to two countermeasures. First, the emergence of corporate forms of management and the welfare state to placate national workforces. Second, following WWII, energy reliance shifted from coal to oil which, due to its geographical dispersal, authoritarian control and technology-dependent production, was less amenable to political disruption.

projectiles of classic military warfare, the vectors of environmental terror are the air, water, urban infrastructures, cellular processes and ecological systems that sustain life and make it possible. Terrorism violently exposes the latency of seemingly benign environmental functions and knowledge-producing systems. It transforms taken-for-granted natural mediums, topographic landscapes, engineered infrastructures and even tools of social and biological analysis, not only into menacing surfaces of surprise and potential catastrophe, but into usable weapons themselves. In a permissive age, when state fragility becomes 'ungoverned space' capable of hiding enemies (Bachman 2008) and anthropological tools of analysis are retrofitted to guide drone attacks and destroy an enemy's social capital (Mac Ginty 2010), nothing is too small or large, too abstract or concrete. For environmental terror, everything has latency and dual-use: everything that touches life, either in its support or understanding, *can be weaponised*.

Liberal societies have long positioned themselves as champions of peace and international stability. If politicians are to be believed, harmony rather than strife is the hallmark of the progressive outlook. Unsettling this reassuring conviction, however, is a paradox that in the post-Cold War era of unending war is now difficult to ignore. While staunchly supporting the precepts of peace, from their inception liberal societies have found it impossible to lessen the political centrality of war in how their citizens are socialised and governed, let alone eradicating its prevalence and impact (Dillon and Reid 2009; Reid 2006). During the Cold War, the future of liberal states was seriously menaced by one of the largest military-industrial complexes in the world, with its passing the opposite – threats of the most intangible, amorphous and uncertain kind – have driven the same states to heights of paranoid hyper-security previously unseen. Liberalism has historically been unable to pursue peace without automatically developing evermore destructive, expansive and environmentally terroristic ways of killing.

During the interwar period, the Hague Commission initially considered banning aerial bombardment on humanitarian grounds. Due to the unwillingness of states to fully relinquish this potent new weapon, it settled instead for outlawing the deliberate targeting of civilian centres while allowing the bombing of urban infrastructure deemed essential to the enemy's war effort (Saint Amour 2005: 134). Critics at the time protested the vagueness of these distinctions, pointing out that with the industrialisation of warfare, everything from jam to rope had a potential military use. At its first legal exploration, the boundary between war and economy blurred opening the entire urban landscape to legitimate attack and thus the progressive normalisation of its terroristic effects (see, Graham 2010). Regarding war and nature, during the 1950s, in rehearsing how to survive a nuclear attack, planners realised that the techniques being developed to protect urban infrastructure were applicable to natural disasters like hurricanes. Natural disasters "...bear a close affinity, in what they do to us and what we do about them, to the unnatural disasters caused by man in modern warfare" (Flemming 1957: 65). Moreover, there was a positive affinity between war and nature to the extent that "...the experience of fighting the disaster helps us create the organizations and learn the techniques needed to fight the much greater disaster of war" (Ibid; also see Harker and Jackson 1969; Massumi 2009). On the terrain of capitalism's critical infrastructure, war, economy and nature collapse into a single problematic of security, whether natural or man-made they become one and the same

thing; a threat now likened to a military attack, and requiring appropriate defensive measures.

Latency and dual-use mark out the reflexive nature of environmental terror. At the moment the vulnerabilities of an enemy's urban infrastructure, were discovered through strategic bombing doctrine, they were simultaneously transposed onto homeland cities and populations. In anticipation of WWII, this not only called forth a system of civil defence in the 1930s (Laurie 1979), the deepening explication led to a growing appreciation of urban vital system's own propensity, due to its radical interconnectedness, to amplify even limited but targeted attacks into system-wide effects. Whereas mass strikes could spread contagiously through capitalism's networked infrastructure, the aerial destruction of the same infrastructure also deemed to have political effects; this time weakening rather than strengthening social cohesion (Anderson 2010). For interwar air doctrine, loss of wages, unemployment and fewer commodities in the shops would undermine worker morale having "...a cascading effect throughout society" (Meilinger 1996: 259). More than seventy years later, it is axiomatic within the emerging field of 'critical infrastructure protection' that, due to their networked nature and close coupling, the latency of urban vital systems lies in their susceptibility to cascading failures as a breakdown in one critical area, such as energy or telecommunications, has a rippling impact on others (Brunner & Suter: 2009).

The vulnerability of critical infrastructure to network failure, however, is only part of the latency that interconnects the cellular with the planetary. The discourse of 'dangerous climate change' now brings together in both time and space the most different and distant phenomena into a single mutually interdependent, self-reinforcing and radically interconnected global security nexus (Grove 2010). Climate change is "...the greatest challenge to global stability and security, and therefore national security" (Cabinet Office 2008: 18; Also DHS 2005). Latency and dual-use achieves a whole new level of connectivity in relation to climate change. It is not just national systems of critical infrastructure that are vulnerable to cascading failures, but the radically interconnected planetary system in general. Changing weather patterns, rising sea levels and extreme weather events, even if their origins lie half way around the world, impact directly on "...on those countries least able to deal with them, and therefore more likely both to suffer humanitarian disaster but also to tip into instability, state failure and conflict" (Cabinet Office 2008: 18). This potential for contagious political instability surrounding state fragility can threaten open markets, international financial stability and the developed world's access to global supply chains (Ibid: 20).

Enacting Survival

Between the 1960s and 1980s, usually operating from secure locations, numerous enactments and scenario-based exercises aimed at surviving nuclear attack took place.² Conducted in private, they rarely received press attention. In this respect, they bear under-researched similarities with current civil contingency enactments relating to

² In the UK, the imaginative enactment of aerial bombardment for preparedness purposes began in 1927. Until the outbreak of WWII, the airforce carried out annual exercises usually based upon a mock attack on London. The object was to both defeat the attack through combined air defence, observer network, search light units and fighter control. At the same time, the bomber units "...were tasked to penetrate the RAF defences and strike London" (Meilinger, 1996: 265).

pandemics, international terrorism, critical infrastructure and cyber-warfare.³ Unlike the essentially educational public enactments of the 1950s (see Davis 2007), these later exercises were mainly concerned with maintaining the functionality of government under catastrophic conditions. Not only were these enactments numerous, they were often extensive, involving dozens of government and institutional actors, sometimes taking more than a year to plan and prepare, and often taking weeks, if not months, to game.⁴ Nuclear attack scenarios in the USA included predictions of strikes rendering up to a third of the country's 120 million people either dead or injured. Within the game parameters, most of the later receiving little or no medical attention, over 35% combined military losses and up 75% reduction in industrial production; all within a cataclysmic few days. From the mid 1950s, in private government pessimism grew about the ability to survive a concerted nuclear attack. Exercises like the aptly named *Four Horsemen*, held in the UK in May 1958, capture the emerging gloom. Subsequent Royal Observer Corp exercises had names like *Cloud Dragon* and *Dust Devil* (1959), *Dust Storm* (1963) and *Dust Bath* (1964), and attempted to enact the heavy fall-out patterns following an H-bomb attack. These were followed in the 1970s by secret military enactments such as *Inside Right*, *Square Leg* and *Scrum Half*.

Compared to the traditional insurance-based statistical-archival knowledge used to understand life's recurrent contingencies, the effects of a nuclear attack on a large city moved risk analysis into the realm of uncertainty and surprise. From the 1950s, as a means of judging the effects on urban infrastructure and populations, and the possibility of survival, imaginative enactment and other predictive scenario-based techniques were pioneered (Collier 2008; Davis 2007; Collier and Lakoff 2008). Lacking an orthodox statistical-archive, civil defence pioneered new techniques to address future uncertainty. During the 1950s, prior to the widespread use of computers, the imaginative enactment of a nuclear attack involved the juxtaposition of different datasets represented as maps, including floor maps. A starting point was the cataloguing of critical infrastructure such as vital industries, public utilities, building types and population densities together with the physical topography of possible attack sites (Ibid). The vulnerability of different urban features was calculated by merging structural engineering data and building codes with results from conventional bombing surveys, atomic tests and the atom-bombing of Japan. Early enactments typically involved the overlaying of a city map showing pre-attack infrastructural vulnerabilities with a transparent acetate of concentric blast circles centred on the presumed point of

³ In the UK, since 2004, these have been organised under the government's civil contingencies umbrella and include such national exercises *Winter Willow* (human flu pandemic), *Hawthorn* (bird flu pandemic), *Atlantic Blue* (international terrorism), *Triton* (extreme flooding) and *Aurora* (emergency health). See, UK Resilience (<http://www.cabinetoffice.gov.uk/ukresilience/preparedness/exercises.aspx>). Under the auspices of Homeland Security, in the US, the National Infrastructure Simulation and Analysis Centre (<http://www.sandia.gov/nisac/>) plays a similar organising role.

⁴ NATO's CIVLOG 65, for example, which imaginatively enacted the military survival of a devastated Europe, took 19 months to plan and was played out between multiple sites over 30 days in May 1965 (Davis 2007: 244). In 1962, at the time of the Cuban missile crisis, the US's Operation Spade Fork involved 27 federal departments including Interior, State, Treasury, Agriculture, Commerce and Labour Departments, together with representatives from the electricity, minerals, solid fuels, gas, petroleum and fishery industries. Many of these actors operated from hardened locations and the Treasury, for example, besides requisitioning, resource allocation and plant seizure, was involved in gaming interventions to stop a run on the banks together with assessing the effects of rationing, wage, rent and credit controls (Ibid: 231).

detonation. By combining vulnerability data with blast information, planners could estimate the likely damage to different urban features. According to the distribution and nature of surviving infrastructure, emergency services, stockpiles and population, recovery and stabilisation could then be prepared for.

Given that the similarities between gaming a nuclear attack and preparing for a hurricane were recognised at the outset, one outcome of the growing indistinction between war, economy and nature was the migration during the 1960s and 1970s of imaginative enactment, developed in gaming the probability of surviving nuclear extinction, into the fledgling market for catastrophe insurance (Ibid). This market has since expanded to indemnify what had previously been regarded as the uninsurable risks generated by capitalist excess (Beck 1992) together with the uncertainties of conventional terrorism (Bougen 2003; O'Mally 2003; Ericson and Doyle 2004). This cross-fertilisation also saw the early appearance of state-based all-hazard disaster capability. In Canada, its key civil defence institution against nuclear attack, established in the 1950s, had its brief changed in 1970 to respond to *any* threat to Canada's vital social-ecological infrastructure, "...effectively everything from blizzards to oil spills to air crashes" (Davis 2007: 20). In America, the move to 'all-emergency planning' gathered momentum during the 1970s, and was solidified in 1978 with the creation of the Federal Emergency Management Agency (FEMA) with a broad mandate covering "...everything from natural disasters to industrial safety, radiological accidents, nuclear attack, and terrorism" (Ibid). In Britain this move occurred in the early 1990s, with local authorities first establishing Integrated Emergency Management schemes to address flooding and other natural disasters (National Archive 2002: 5.20).

An important impetus for the migration of military technologies into the 'civilian' space of environmental disaster capability was the public disquiet that dogged nuclear civil defence during the Cold War (Davis 2007). Especially, how from the 1960s, civil defence had effectively abandoned the public to their own luck and personal resilience (Ibid: 52-56). For many anti-war activists, the development of all-hazard disaster relief was a more progressive way of using available scarce resources (Campbell 1982: 18). Writing in 1970, Peter Laurie, an early critic of civil defence's anti-civilian bias, argued that there was "...a growing worldwide movement among civil defenders to redefine their role in terms of all these [natural] catastrophes, using common procedures and standards so that international cooperation at an operational level can be swift and effective" (1979: 15). For activists, nuclear civil defence was a cynical distortion of a more preferable public good. If a disaster capability was necessary, then an ability to manage environmental emergencies in general was preferred. However, rather than seeing all-hazard relief, as activists did, as somehow expanding a specifically civilian space, given the military origin of the technologies involved, the 1970s are better understood as a decisive moment in the militarisation of the environment.

The co-evolution of resilience in war, nature and economy

The 1970s marks the end of the post-War settlement (Wallerstein 1996). In Britain, it saw the opening salvoes of a battle that would result in the effective defeat of organised labour. By the end of the decade, outsourcing and de-industrialisation of Britain's manufacturing heartlands was gathering momentum, so too the dismantling and selling-off of public infrastructure. In this encounter, workers lost the last remnants of their

control of the labour process that, as late as the 1960s, due to its remaining connectivity, especially around the motor industry, had maintained the possibility of the spontaneous mass strike (Duffield 1988). It is a time when the dialogue between war, economy and nature enters a period of growing indistinction. Techniques of imaginative enactment pioneered in civil defence and, importantly, expertise gained through gaming the survivability of nuclear attack not only vectored into an all-hazard emergency capacity, they overlapped with the discoveries of complexity, emergence and resilience within nature (Holling 1973). In the performative gaming of surviving nuclear attack, the origins of resilience as an approach to future uncertainty can be traced in the mobilisation for war. In the co-evolution of science and society (Rose & Rose, 2010), resilience first emerges as a politico-economic calculus for surviving the probability of societal extinction which, itself, is grounded and made expansive in the observable characteristics of predator/prey behaviour in the natural world.

The discovery of resilience in the natural world was intimately connected with a critique of Newtonian notions of equilibrium then dominant in biology and engineering (Holling 1973). This orthodoxy held that systems had the capacity to return to 'normal' after a catastrophic event. In ecology, as in war, the paradigm shifted from concerns with maintaining equilibrium to contemplating the "...probability of extinction" and a search for the "...conditions for persistence" (Ibid: 1). In ecology, the primary site of this exploration were predator/prey relations in the natural world (Holling 2008). The probability of surviving extinction was bound up with the ability of natural systems to move to new states of equilibria, or near equilibria, while maintaining functionality. The issue became one of judging "...how likely it is for a system to move from one domain into another and so persist in a changed configuration" (Holling 1973: 10). Similar to the state of society after a nuclear attack, nature was rediscovered in terms of randomness, surprise, uncertainty and a necessary absence of key areas of knowledge. Through embracing uncertainty and lack of knowledge not as problems but attributes intrinsic to living systems, the resilience framework was able to "...accommodate this shift of perspective, for it does not require a precise capacity to predict the future, but only a quantitative capacity to devise systems that can absorb and accommodate future events in whatever unexpected form they may take" (Ibid: 21).

From hardened regional strongholds, the gaming societal resilience within nuclear civil defence valued decentralisation, flexibility, adaptation, communication and information exchange. Besides their allocated personnel, the precise role of the UK's secret Regional Seats of Government, or RSGs, during the 1970s and 1980s, for example, was loosely defined to maximise flexible decision making. Within the context of enactment, new ways of governing, including welfare, the economy and policing, were explored (Davis 2007). The discovery of complexity in ecology at the height of the Cold War maps directly onto the gaming of surviving the probability of nuclear extinction and *vice versa*. While the long-term was usually absent from official war plans, scenarios did envisage the problem of moving between temporary stages of attraction or relative equilibria, while still retaining government functionality. The UK's secretive 1982 *Scrum Half* national war-game scenario, for example, envisioned that an important role for commissioners would be managing such a transition. While recognising a substantial reduction "...in economic and social terms", the post-attack phase would necessitate the "...choice of long term objectives which are realistic" including the "...establishment of

sustainable living standards” through the “...selection and development of appropriate technologies” for a post-nuclear society (Campbell 1982: 77).

By the early 1960s, the use of computers in imaginative enactments had begun to displace an early reliance on pencils, paper, floor maps and slide-rules (Davis 2007). In gamming the movement between different domains of stability, the introduction of computers proved especially useful in modelling the post-attack economy. Originating in WWII as an optimal way of distributing scarce resources among competing demands, systems analysis and complexity thinking were especially important. Helped by computers, enactments were able to increase the number of variables involved, including adding time lapses, thus increasing flexibility through the generation of unforeseen consequences. Outcomes became more random and, in the move from maps and *in situ* tests, system analysis enabled detailed logistical envisioning at the societal and international level. More and more aspects to the economy and management science could be factored in “...with less and less reliance on human behaviour within rehearsals” (Ibid: 69). Computers enabled a greater ‘realism’ to be enacted in terms of what infrastructure would remain functional, what equipment and skilled labour would be needed to run it, what global supply-chains would exist and what capacity would be needed to secure them.

Interestingly, the co-evolution of non-linearity and complexity in war and nature, together with the ability of complex systems to survive perturbation by moving between different stability regimes, also mapped onto contemporary departures in neoliberalism. Especially, those associated with the work of van Hayek. Here, like war and ecology, there is a similar rejection of classical mechanics and equilibrium theory and an early adoption of the lexicon of complex adaptive systems (Cooper and Walker 2010). Directly encouraged by organisations like the Resilience Alliance,⁵ resilience has subsequently emerged as a *lingua franca* of risk, preparedness and survivability working across war, nature and economy (Ibid; Dillon and Read 2009). Through the growing explication of the environment’s complex interconnectedness and latency – through its growing ability to become terroristic if you will – the enormity of the uncharted dangers facing life and society created by capitalism, as reflected in the limits of conventional statistical-archival risk analysis, have taken shape (Beck 1992). By the early 1970s, in what was a foundational event in the emergence of the environmental movement, nature was now seen as capable of succeeding where politics had failed: imposing its own limits on Fordist systems of exploitation and accumulation (Meadows, Meadows and Behrens 1972). As Melinda Cooper has argued, it was this presumption of a limit to accumulation and thus profit that, initially in the USA, spurred a wilful blurring of economy and nature with the expansion of biotechnology (Cooper 2008). This neoliberal departure was built as much on cellular futures and financial speculation as production itself.

Today, uncertainty is measured against the open acknowledgement that, given the range of possible threats, governments alone cannot protect people against all of them (Cabinet Office 2008: 42). However, according to the new risk orthodoxy, while we cannot fully protect ourselves against uncertainty, we can improve our preparedness

⁵ See <http://www.resalliance.org/1.php> (accessed 20 September 2010).

for it. Through imaginative enactment, role-play, disaster rehearsal and other scenario-based techniques and hazard modelling tools, we can overcome our inability to predict by gaming our response capacities in relation to scientifically constructed future threat scenarios (Collier 2008). Originating in war, these techniques are now generalised as tools of strategic planning for the imagining potential futures “...and then managing their consequences” (Lentoz and Rose 2009: 236). Using such imaginative all-hazard tools, preparedness can be strengthened thus reducing potential exposure and vulnerability; an uncertain future can be brought into the present as a tangible object of policy (Cabinet Office 2001).

Within the new risk orthodoxy, because emergencies cannot be fully predicted, preparedness will not stop them from happening. It will, however, help recovery from them. In this respect, the key term of art, now ever-present across the sciences and popular media, is *resilience* (Zebrowski 2009). In the space of a decade, resilience “...has become ubiquitous as an operational strategy of emergency preparedness, crisis response and national security” (Cooper and Walker 2010: 25). Resilience, however, is more than just recovery; it is the ability to survive through adaptability. A resilient system is capable of not only reforming around a new stability regime but, if necessary, moving between several such relative states, while still retaining essential functionality. For a resilient system, uncertainty is not a necessarily negative condition; it can also be positive and productive. Despite their downsides, disasters can also provide creative opportunities to establish something new; new ways of coping, living and, not least, making money (Cabinet Office 2008; Klein 2007).

A changing biopolitics?

The call for resilience in the face of environmental terror challenges our understanding of biopolitics. Foucault’s original work on biopolitics traces its emergence in late eighteenth century Europe (1998; 2008). It explores the discovery of the species-characteristics of human population through departures in statistics, probability, demography and public health. Geared to supporting life at the normative or aggregate level, this form of biopolitics achieved its political zenith in the modernist welfare and New Deal state (Cooper 2008). The gestation of modernist biopolitics was inseparable from the generalized societal mobilisation needed to pursue both Fordist patterns of mass manufacturing and its associated military form of interstate total war. Indeed, without the national ‘cradle to grave’ welfarism that made mass mobilisation possible, the modernist command-and-control interconnections between war, economy and nature would not have been possible (Van Creveld 1991). However, seeing total war as environmental terror forces a shift in the way existence and its environmental-life world is understood. While emerging within modernism, a post-modernist or rather neoliberal biopolitics denotes a view of the human condition at odds with welfarist notions of social protection. That is, life as an aggregate or mass phenomenon governed through discipline, knowing the future, standardisation, inter-generational reciprocity and full employment, all in the interests of maintaining societal equilibrium.

Taking its analytic cue from complexity science and ecology rather than statistics and demography, a neoliberal biopolitics is more concerned to promote life that is resilient, able to exist on the edge of survivability, and adapted to uncertainty and surprise; a life that has abandoned trying to know the future and its associated prudentialism. Instead

of providing a modernist *freedom from* the social pathologies of everyday life through, for example, normative regimes of inter-generational social insurance, resilience is more attuned to a neoliberal ethos allowing a *freedom to* embrace contingency as the essence of foresight and enterprise (O'Malley 2009). In addition to population, this new biopolitics is more concerned with privileging the interconnected cellular structures, technical infrastructures, social networks and ecological systems and services, that is, the environment life-world that supports human and non-human existence *in toto*. It privileges the material and effects-based nature of critical infrastructure (Aradau 2010). The standardisation and command-and-control managerialism of modernism has given way to a neoliberal biopolitics that values life in terms its resilience and self-reliance necessitated by the intrinsic uncertainties generated through the insatiable capitalist process of accumulation by dispossession (Cooper 2008; Harvey 2003). Besides the ongoing appropriation of the global commons, dispossession includes the privatisation of public infrastructure and dissolution of the social wage. Resilience speaks to capitalism's constant transgression of limits, its inability to leave anything alone for long and the permanent revolution it effects in social and institutional life. Life is speciated according to the usefulness, irrelevance or threat it represents for the infrastructural and biospheric systems necessary for capitalism's widening cycles of reproduction, consumption and accumulation.

With this departure from the modernist ideal, some question whether the changes we observe can properly be called biopolitical (Masummi 2009). Rather than a modernist inclusion, albeit in a normative manner that excluded in equal measure, a neoliberal biopolitics that privileges the environmental life-world effects a conditional abandonment of humanity. It suggests a pessimism regarding the human condition that is embodied, for example, in the climate change debate. This aporia has even been given a name, the Anthropocene Age where 'human activity', rather than being the engine of progress, is now presented as the prime threat to existence itself (Rockstrom *et al* 2009). At the same time, given the short-termism of politicians and political calculation, addressing the problems of the Anthropocene has been placed beyond capabilities of democratic and accountable politics (Giddens 2009). Following from the neoliberal critique of modernist managerialism and standardisation, biopolitics today values life in its productive abandonment to uncertainty. Rather than something to be protected against, disasters now present themselves as opportunities for rebirth and profit (Klein 2007). Resilience in the face of shock is the discourse of this speculative abandonment to uncertainty (Cooper and Walker 2010). As Julian Read (2010) has argued, a political subject is defined in its ability to transcend dangers and, in providing protection from them, to resolve the problems of life. Resilience, with its insistence that dangers cannot be predicted or protected against, represents the abandonment of political subjectivity. It is a denial of the ability to function politically.

Gaming abandonment

Resilience is an ideology attuned to the uncertainties of a neoliberal economy. At the same time, these uncertainties arise from processes of abandonment, including privatisation. They are a willed condition rather than an independent or, indeed, divine change in the external environment. Just as resilience emerges in gaming the likelihood of surviving nuclear attack, public abandonment also figures in these enactments.

Before considering the issue of wilfully becoming unprepared and, especially, how the bunker, broadly conceived, is the prime architectural form of elite security against uncertainty, the gaming of abandonment will be briefly considered.

While somewhat dispelled during WWII, if one considers civil defence from the inter-war period to 1980s, a general pessimism regarding the strength of public morale under bombardment was its default setting.⁶ Again, with the exception of the prudential defence of the public during WWII, a government willingness to abandon any serious effort at civilian protection in the event of an aerial attack was a defining feature of this period. Strategic bombing doctrine, or 'morale bombing' as it was called during the 1920s, envisaged destroying an enemy's political will through the unleashing of environmental terror. It follows that civil defence was charged with managing the social breakdown, mass neurosis, political agitation and demands for appeasement expected to come from a home population subject to a similar pounding. It was widely believed during the 1930s, for example, that people would regress to an earlier level of desires and "...behave like frightened and unsatisfied children, and demand, with all-or-nothing vehemence of infants, the security, food and warmth which the mother used to give in the past" (Laurie 1979 :22, quoting Richard Titmuss). By the end of the decade, planners were predicting massive German bombing raids on British towns, especially London. In expectation of mass social breakdown, it was proposed at one stage to augment the Metropolitan Police by an extra 120,000 men to form a physical cordon around London to forcibly drive those civilians attempting to flee back to their duties (Ibid: 22). By the outbreak of WWII, there were expectations of a quarter of a million casualties in London in first three weeks, three to four million psychiatric cases, three million displaced, and half its buildings destroyed. Looking back from the Cold War, despite taking place over a longer timescale, "...people were thinking *then* of devastation essentially nuclear in character" (Ibid: 24, original emphasis).

Given these fears, it is not surprising that interwar civil defence inherited the counterinsurgency system of regional commissioners and emergency powers set up to deal with effects of a mass strike. Indeed, until brought together and superseded by the 2004 Civil Contingence Act, the 1920 Emergency Powers Act and what became the 1948 Civil Defence Act where were the two main strands of emergency legislation covering states of exception in post-War Britain. In the event, the apocalyptic destruction envisaged in 1930s war scenarios never materialised during WWII, nor was the system of Regional Commissioners activated. German bombing killed about 60,500 people, or the equivalent of a year's natural UK death rate on top of that naturally occurring during the six years of war (Ibid: 24). Moreover, since its first practical outing in WWII, the ability of 'effects-based' air-power to shatter public morale has never lived up to expectations. If anything, it increases solidarity and spreads resistance. This historic

⁶ Doubts over the public's morale fibre and fears of mass hysteria resulting from aerial bombardment persisted into the first year of WWII. Concerned that it would further undermine morale and serve little practical purpose given the extent of the devastation envisaged, the authorities initially refused to contemplate a protective mass shelter programme. It was only with the formation of a coalition wartime government in May 1940 that this situation gave way to a regime of civil defence that provided insurance against attack. This included an evacuation programme for vulnerable women and children, the development of an effective Air Raid Precaution (ARP) and emergency rescue system, a national household Anderson-shelter programme, opening London Underground for shelter purposes, and digging several purpose-built deep shelters in the capital (Campbell 1982).

inconvenience, however, has not prevented its monotonous reinvention by the military planners and drone-jockeys pursuing today's environmental and infrastructural wars (Graham 2010; Anderson 2010).

Duncan Campbell's *War Plan UK* (1982) draws heavily on leaked scenario documents regarding the *Hard Rock* exercise planned for 1982. Like the 1970s operations preceding it, this exercise did not involve any post-attack civilian protection measures. The focus was the transition to war and government survival. *Hard Rock* was the largest Home Defence exercise since the disbanding of civil defence in 1968. In the event, the exercise did not go ahead because many local authorities "...refused to play" (Ibid: 27), resulting in the then Thatcher government changing the law to compel future participation. While not gamed, the scenarios give an indication of how planners envisaged the effects of a nuclear attack. *Hard Rock* was premised upon the war opening with conventional attacks on NATO forces in Europe escalating to include shipping and the North Sea oil and gas platforms. With civilians beginning to spontaneously evacuate the cities prior to nuclear attack, the RSGs are opened and staffed, and emergency powers promulgated. Even in the run up to the attack "...the scenario outlines a grim picture of fleeing refugees, food and other supplies becoming exhausted, and public disorder" (Ibid: 42). Each team engaged in the enactment "...plays through lists of events and problems that portray a grim, devastated and suffering society" (Ibid: 59). In the immediate post-attack phase, conditions were held to vary from region to region. However, the world they describe "...is one of huge, wild mobs, roving the country in search of food stores and government targets. Medical centres are overwhelmed within a few hours of the start of the attack, and begin a process of *triage* – or sorting" (Ibid: 61).

This post-attack scenario is, in many respects, evocative of present-day humanitarian operations in the global South. The fortified aid compounds and their secure interconnecting transport and communication corridors that spatially demarcate the archipelagos of international aid (Duffield 2010) function similar to, but now as a lived reality, how the RSGs were gamed during the Cold War. From within their fortified compounds, aid workers make sovereign life and death decisions in the context of the collapse of modernist forms of state-based welfare and social protection. In the case of *Hard Rock*, this was the result of the nuclear devastation of the social state. Regarding the global South, neoliberal structural adjustment had a similar effect on the modest but real modernist advances that had characterised the continent until the 1970s (Bloom & Standing 2001; Cornia 1987). The *Hard Rock* scenario can be read as a theatrical premonition of the new biopolitics. It narrates a story of survivors triaged and sorted in terms of their usefulness to the surviving critical infrastructure and the bunkered interests controlling them. It is a premonition of residual public welfare and social protection where the future, with its emphasis on constant adaptation and self-reliance dressed as active citizenship, now resides in the global South rather than the North.

Drawing on precepts developed in the *Inside Right, Square Leg and Scrum Half* scenarios, the *Hard Rock's* devastated cities would be left until they had burnt out and the radiation subsided. The triage of survivors would be completed under martial law conditions. In some places, refugee camps would be established for those fleeing the cities to help prevent friction with locals. Dosed with radiation, many of immediate survivors would literally have been 'walking dead'. Telex exchanges during *Scrum Half*

demanded that “zombies” be kept from mingling with healthy survivors (Ibid: 63). Suspected disease carriers would be quarantined in ‘Special Rest Centres’ under military guard. In medical centres, those showing signs of radiation would be refused both food and medical treatment of any kind. In such situations, the scenario envisaged that they many people would “....rampage and loot for food, and, their activities may threaten sheltering survivors, or government depots, bunkers, communication facilities or other key points” (Ibid: 62). As a general measure, within these enactments emergency food would not be released by the regional commanders to the feeding centres until two weeks after the attack. Until then, “...the people would have to survive with what they had stored or carried with them as they fled” (Ibid). Looters would be shot. In all matters, human beings “...would be judged on their worth to the government in the most rigorous and ruthless way – there would be no other course” (Ibid: 76).

Becoming Unprepared

The collapse of a modernist welfare state providing protection from life’s social pathologies was constantly gamed in the scenarios of surviving nuclear attack. Survival was reflected in the ability to move from once state of equilibrium to another while still maintaining essential functionality; in this case, the continuity of government operating through a regional network of fortified bunkers. Those that managed to survive outside this defended archipelago would do so by a mixture of luck, self-reliance and, at best, a modicum of basic humanitarian assistance. Of necessity, they would have embraced resilience in the face of uncertainty and surprise.

The constant gaming of this scenario interpolates the real-life fragmentation of the modernist project that gathered momentum during the 1970s. Steven Graham and Simon Marvin, in their *Splintering Urbanism* (2001), chart this fragmentation through the impact of privatisation, deregulation and a changing professional and aesthetic urban culture. In terms of architecture and design, the retreat from standardisation and comprehensiveness reverberated throughout urban planning and the ownership, management and design of critical urban infrastructure. Others have documented the associated ‘death of the social’ and the shift way from welfarism to the neoliberal ethos of choice and active citizenship (Rose 2000). As the NGO phenomenon suggests, compared to state-based international aid of the 1950s and 1960s, development assistance has also been widely privatised (Duffield 2001). A across a wide global front that takes in engineered systems, urban planning, social policy and international development, and even then is not exhaustive, modernist attempts to protect, standardise, and provide comprehensive solutions in order to maintain social equilibrium have been critiqued, dismantled and pushed back (O’Malley 2009). They have been replaced by a crusading neoliberal ethos hostile to collective solutions and attempts to know the future. In their stead, we are urged not only to accept the uncertainty of constant change and disturbance, but also to be open to their effects, since uncertainty is the basis of foresight and enterprise. Indeed, it is a new ontology of life. We are being invited, in a sense, to be unprepared.

To take the example of the critical urban infrastructure associated with energy, transport and communications. During the 1980s and 1990s, critical infrastructure was subject to deep and widespread processes of privatisation, deregulation and globalisation. An essential element in this process of fragmentation was the

liberalisation of financial markets and the creation of venture capital allowing not only the private purchase and internationalisation of critical infrastructure ownership, but also driving the speculative biotech and genetic revolutions as well (Cooper 2008). Internationally, urban vital systems and ecological services have been opened to private ownership and marketisation. Some estimates for Europe currently put between 70 – 80% of critical infrastructure in private hands, while figures for America hover around 85% (de Bruijne & van Eeten 2007: 22), making it one of the most important sectors for the international flow of capital, finance and expertise (Graham and Marvin 2001: 13). At the same time, privatisation represents a major reorganisation of vital systems internationally. Monopolistic forms of service supply associated with nationalised industries and regulated markets, together with their attendant command-and-control management systems, stockpiles and engineered redundancy, have been replaced by market competition, institutional fragmentation and a growing reliance on real-time crisis management as networked structures exploit the innovative departures and risk-taking that accrue from operating on the edge of system-failure (de Bruijne & van Eeten 2007).

Political risk orthodoxy holds that with the passing of the Cold War, the old certainties have given way to a new international order of uncertainty and surprise (Rasmussen 2001; Coker 2004; Williams 2008). Whereas Superpower military rivalry provided a window for prediction, today's networked and more hidden threats are less obliging. This change is usually presented as a somehow natural shift in the external environment, with new and more amorphous threats emerging as if divinely. When this is set against the wide-ranging neoliberal crusade against modernism, however, a different perspective emerges. As Andrew Lakoff (2008) has argued in relation to pandemic threats, when one compares the comprehensive approach to health protection existing in the past with today's call for resilience and adaptation, rather than any spontaneous change, the history of systematic dismantling, opening-up and profit-seeking separating the two approaches invokes a sense of wilfully 'becoming unprepared'. From this perspective, the multileveled processes of privatisation, marketisation, deregulation and internationalisation underway globally since the 1980s appear as a generalised politico-economic experiment in Naomi Klein's (2007) 'shock doctrine' resulting in the man-made creation of a fragmented, uncertain and threatening global 'environment'; a willed uncertainty that functions both as a means of governing and a the needs of capitalist system now geared to speculation rather than production.

A sense of wilfully becoming unprepared can be detected in the emergence of the idea of critical infrastructure protection (CIP). Critical infrastructure has long been a security concern of liberal states (de Bruijne & van Eeten 2007; Kaika and Swyngedouw 2000), however, it re-entered the political foreground in its present form in the mid 1990s. Initially prompted by concerns in the Clinton administration (Clinton 1996), CIP emerged in relation to anxieties over the reliability and security of vital systems following their widespread privatisation, institutional fragmentation and internationalisation, coupled with an increasing dependence on private information and cyber-based technologies to make them work (Cooper and Walker 2010; Dunn-Cavelty 2009; Brunner and Suter 2009). Within CIP there is an implicit recognition that neoliberal reforms and devolution of powers and outsourcing of public services "...have themselves introduced a certain level of endemic risk into the normal operations of everyday life" (Cooper and Walker 2010: 29). Within this environment, rather than

defining an objective condition, resilience functions more as ideology. In promoting a post-political life of constant adaptation, it preaches the abandonment of long-term expectations and while maintaining the limits of predictive knowledge (Cooper 2010: 10). Important here is Marx's analysis of capitalism "...as an imminent system that's constantly overcoming its own limitations, and then coming up against them once more in a broader form, because its fundamental limit is Capital itself" (Deleuze 1995: 171). The limitations in this case being Fordist methods of industrial production tied to national forms of welfare and New Deal state protection. In overcoming these limitations to accumulation, from the cellular to the planetary, they have returned in the broader form of an environment that, as a result of the constant attacks and exactions made upon it, has itself become terroristic.

The bunker

As a defensive measure against uncertainty and surprise, the primary military response to environmental terror has been the defended or fortified *bunker*. Broadly understood, however, bunkers have proliferated in form and scale in response to the environment becoming terroristic. Bunkers comprise strongholds or defended zones that, using anything from physical walls to visual cues or cyber-barriers, have spatially demarcated inside-outside boundaries and defended portals. In a neoliberal world, where life is speculatively abandoned to uncertainty and governed through varying forms of exceptionalism, bunkers provide sites of private consumption and protection for political, economic and cultural elites. They represent a secure organisational form from which experiments in the resilience of others can be orchestrated. Indeed, the bunker has emerged as the architectural response to the abandonment of the political: their walls, checkpoints and bypasses mockingly occupy the space vacated by politics.

Bunkers exist in multiple forms with wide variations in scale and connectivity. They include both physical and cyber-based forms, including hybrid structures managed via the internet or software packages. Bunkers range from residential gated-communities through private shopping malls and central business districts to military green zones and emerging resilient cities (Minton 2009; Hodson & Marvin 2009; Davis & Monk 2007; Gregory 2004). In cyber-space they include firewalls and walled gardens, and the internet-managed preferential access arrangements and tapered tariff structures governing credit, communications, energy and water. Bunkers can be defended, even hermetically sealed, against attacks from a wide range of environmental threats. They possess varying degrees of self-sufficiency ranging from private security to being near independent of their surroundings for vital ecological services. In the case of emerging resilient cities, this self-sufficiency can include long-term land leasing arrangements in the developing world as a guarantee of food security (Cotula *et al* 2009). Interconnected by different types of secure corridor, bypasses and protected networks of circulation and exchange (Coaffee & Wood 2006), bunkers provide archipelagos of elite refuge and consumption in an uncertain and dangerous world. Compared to the endless studies of poverty, radicalisation and subaltern alienation, there is a dearth of elite ethnographies and control-room narratives.

Bunkers, defended corridors and secure archipelagos can be seen as an essential part of the mouldings and apparatus of spatial modulation, creating sieves of varying mesh and corridors of different velocity, essential for the emergence of control societies (Deleuze

1995). The genealogy of the bunker as a defence against environmental terror can be traced in the military response to fears of revolution and aerial bombardment in the early part of the Twentieth Century. By the early 1920s, concern in Britain was rife that a mass strike arising from the close-coupling of vital systems could paralyse the country. In response, preparations were made to divide sovereignty between a number of autonomous regional centres under the control of appointed regional commissioners. Empowered to make sovereign decisions should communications with London be severed, regional headquarters were established in more than a dozen British cities (Laurie 1979: 21). While there were some modifications to this originally counterinsurgency system of regional command bunkers, notably the addition of a few new centres and their especially their physical hardening, the same regional centres were taken over during the 1930s as the geographical basis of civil defence against aerial attack. These regional headquarters were especially prominent during the Cold War as the basis for continuity of government planning (Campbell 1982).

While there are important nuances, in the US, Canada and the UK the broad trajectory was similar. As the power of nuclear weapons grew, missile technology improved and the estimates of death and destruction increased. Rather than the mass protection and insurance approach to civil defence that (eventually) emerged in WWII, official thinking began to focus on the continuity of government and vital systems while leaving the public's survival, apart from palliative rehearsal and educational measures, to luck and self-reliance. In the UK, this shift was marked in 1972 by a name change from Civil to Home Defence. The latter was about "...the protection of *government* – if need be, *against* the civil population (Campbell 1982: 15, original emphasis). An important element of both NATO and UK planning, for example, was controlling and managing a restive population expected to 'stay put' and cope. The shift to home defence signalled a preoccupation with the possibility of internal insurrection as much as aerial bombardment itself. With the ending of the Cold War, this generalised fear of an environmental enemy – an enemy not only within and without but, even worse, able to communicate with each other – has been rolled-out as an essential part of today's security state (ippr 2008).

A key aspect of home defence was the physical hardening of a decentralised infrastructure of emergency government. Defence against nuclear attack, quite literally, went underground (Davis 2007). In the UK, through a mixture of new purpose-built complexes and upgrading existing structures, an inherited regional system of shadow government, was hardened to form a dozen autonomous Regional Seats of Government (RSGs). Through the Post Office, and the cooperation of the semi-autonomous oil companies, together with the designation of strategic roads, these regional seats of government were designed to be hermetically sealed and, for several months, self-sufficient in food and energy needs. Through dedicated communications systems they were connected to other branches of government and a network of similarly protected monitoring and military outposts (Laurie, 1979; Campbell 1982). Apart from government and military officials, the RSGs were also intended to include representatives from "...all manner of other public enterprise – fire and ambulance services, British Rail, Gas and Electricity Boards, Water and Health Authorities, the NCB and British Telecom, transport and construction enterprises, public and private – each acting out scenarios for their part in the 'survival' and 'recovery' phases" (Ibid: 74-75). These shadow forms of government duplicated essential state and infrastructural

functions and provided managerial redundancy in the event of attack. Armed with emergency powers, their aim was to maximise state survival and the eventful reassertion of national sovereignty, albeit in an altered and truncated form.

The military bunker achieved its zenith during the Cold War. Through the politico-economic generalisation of environmental uncertainty, however, the bunker has spread more widely to become neoliberalism's signature urban form. As a general principle, the privatisation of critical infrastructure and vital systems is tantamount to the privatisation of space. The fragmentation of the modernist project has been coterminous with the burgeoning expansion of a wide variety of private security operators and organisations responsible for such things as residential complexes and shopping malls to pipelines and elite rescue (Mills and Stremlau 1999; Leander 2005; O'Reilly 2011). Since the 1980s, the most widespread or, at least, iconic response to growing environmental uncertainty has been the emergence of private 'gated-communities' (Blakely & Synder 1997; Merry 2001; Davis 2006). Elites across the development-underdevelopment divide are extricating themselves from the public sphere. Whether from fear of crime, collapsing services or decaying urban governance, they are driving the widespread appearance of private bunkers offering varying degrees of self-sufficiency with regard to essential services, transport and security (Rodgers 2004). Within fragile states, the international aid industry's increasing demand for secure residential and office accommodation is also part of this global process of *public* deterritorialisation and *private* reterritorialisation through the changing governance of urban critical infrastructure and vital ecological systems (Duffield 2010).

Reflecting these trends, and having a more direct genealogical link to the military bunker, changes in the policing of the city in the global North are instructive. Since the 1960s and 1970s, coterminous with the gaming of nuclear survival, planners have approach urban crime through the idea of 'defensible space' (Newman 1973). The idea of 'rings of steel' entered the security lexicon in the 1970s through the UK's experience with terrorism in Northern Ireland (Coaffee & Murakami 2006). Belfast provided a laboratory in terms of using razor-wire and steel gates for the defensive rezoning of inner-city areas against car-bomb attacks. Defensive cordons were further developed around London's key financial district during the 1990s. These incorporated advanced CCTV derived from the military technology of the First Gulf War, including Automatic Number Plate Recognition (ANPR) that could be checked against police databases. If military gaming had been concerned with continuity of government, these measures aimed at 'continuity of business'. Through planning security zones, restriction and surveillance, the aim was the construction of "...secure borders to create a 'safe' territorial haven" (Ibid: 507). The existence of a bunkered enclave was used during the 1990s in the promotion of London's central business district investment drives.

In the wake of 9/11, however, there has been a shift in defensive strategy from reaction to proactive anticipation and the generalisation of risk management at the sub-national level. Policing risk has seen the growth in electronic surveillance including automated software solutions originally designed for military application. Residential gated communities, airports, defended civil buildings, universities and shopping malls have widely embraced "...physical or symbolic notions of the boundary and territorial closure" (Ibid). From being a fixed ring of steel, the security bunker has become mobile feature of the resilient city. In offering flexible continuity of government and business

security, portable bunkers now offer short-term 'island site' or 'stage set' security for the policing of party-political conferences, international gatherings or major sporting events. Stage set security is erected around the event and then dismantled afterwards leaving little visible trace. The policing of the Labour Party conference at Gateshead in 2005, for example, involved road closures, a flight exclusion zone, 1,000 police officers on duty, river searches and patrols, police on jet skis, snipers on high buildings and mobile CCTV coverage (Ibid: 512). To an ever increasing cost, these policing methods also incorporated major sporting events and the visits of foreign dignitaries. Island site security typically merges with government's other resilience measures. The Greater Manchester police and other 'blue light' services, together with the local Regional Resilience Forums, for example, at a cost of £4.2 million, "...organised security well in advance of the September 2006 Labour Party Conference with military-style provision" (Ibid). These multileveled linkage mean that, depending on the event, a temporary 'ring of steel' security zone can be patched into local and regional procedures for evacuation, decontamination and major incident access. Reminiscent of Cold War Home Defence, the Manchester conference was "...role played at tabletop exercises well in advance of the actual conference" (Ibid).

Within cities more generally, private business districts, diplomatic areas, shopping malls and bypass roads have opened up new privately policed zones of relative affluence and connectivity (Gillen 2007; Minton 2009; Montgomery 2009). At the same time, a privileged space of international urban flows now blurs the development/underdevelopment divide. While the ramparts of Fortress America, Europe and Australia generically speciate humankind into those able to circulate those destined to stay put, the privileged spaces of international flows magically interconnect the privately policed central business districts and temporary 'stage set' security events of the global North with, for example, the fortified UN aid compounds, defended diplomatic quarters, zones of state reconstruction and tourist enclaves of the global South (Duffield 2010). An extraordinarily variable geography of security now exists that selectively and hierarchically integrates preferential spaces, times, markets and people to the exclusion and bypassing of dangerous and surplus populations (Bauman 2004). Not only are global cities now marketing their security advantages in a drive to capture inward investment (Coaffee & Murakami 2006), at a time of uncertainty and resource constraint, they are also reaching out to distant markets and engaging in selective integration with other cities as they compete for scarce resources to maintain consumption and ecological security (Graham and Marvin 2001; Hodson and Marvin 2009). Some are even leasing land in 'under-populated' areas of Africa to ensure their own future food security (Cotula *et al* 2009).

For those with the right passport and money, this exclusive international space is one of almost magical possibilities, unfettered by any remnant of social contract, where "...the rich can walk like gods in the nightmare gardens of their deepest and most secret desires" (Davis and Monk 2007: ix). To cater for those whose business still requires personal travel within the global South, an emerging transnational security consulting industry is now offering increasingly comprehensive forms of elite rescue. This concierge style security service covers everything from advice on risk reduction, expert negotiation in the case of kidnap to evacuation in the event of civil unrest or pandemic (Johnston 2011). While stasis has long been recognised as the fate of the disposed, ill-

educated and marginalised, in an age of speed and connectivity, we are all being graded in terms of our relative velocity and which secure corridors we may, or may not, access.

Conclusion: declining urban resilience?

The advent of environmental terrorism and, not least, an environment which itself can be terroristic, has profound implications. The trend towards bunkerisation, for example, questions where cities are actually losing resilience in the face of uncertainty. At the same time, when our approach to collective security has effectively abandoned trying to know the future in favour of constant adaptation, whether collective challenges such as climate change can, indeed, be met. Regarding the first of these concerns, if neoliberalism has a spatial form, it is reflected in the complementarity between the 'bunker' and the 'camp' (Agamben 1998). The latter concerns those camp-like sites of juridico-spatial abandonment that are governed through varying forms or degrees of exceptionalism. They range from the more obvious camp situations such as asylum-seeker detention centres and other forms of extra-judicial confinement (Noll 2003), to the more porous frontiers of social-housing's dump-estates governed through administrative public-order measures (Hornqvist 2004) or the growing ranks of Internally Displaced Persons (IDPs) trapped within war zones who, denied the ability to cross an international frontier, are trapped within a legal limbo (Crisp 2003). Linked by secure corridors and by-pass systems, these camp-like spaces are isolated, marked out and monitored by bunkered archipelagos of elite circulation and consumption that simultaneously serve as sites of governance and control. In terms of the defensive and offensive urban architecture involved, Israel, the Occupied Territories and Gaza sharply demonstrate the stark complementarities of the bunker and the camp in contemporary life (Weizman 2007).

If critical urban infrastructure, given its complex and adaptive nature, can be likened to an ecological system, then the openness, connectivity and accessibility of this infrastructure can be equated with biodiversity. The fragmentation of vital systems and the spatial division of the urban into bunkers and camps, in short, the rupture and increasing restriction of urban flows, suggest as a metaphorical loss of urban *sociodiversity*. Within ecological systems, the loss of biodiversity increases fragility and reduces the ability to absorb shocks and ward off system failure. To extend the metaphor, within the city an equivalent loss is reflected in the increasing social polarisation around access and control of vital systems (Minton 2009). The fragmentation of critical infrastructure, the curtailment of welfare programmes, the growth of private as opposed to public space and the consequent reduction in societal exchange has been argued to lead to contagious forms of urban collapse (Wallace & Wallace 2008). As cityscapes become disaggregated through the biopolitics of abandonment, blighted areas are vulnerable to the spread of drug, violence and crime related issues. Cities, short of violence and the continued growth of island policing, are losing their ability to absorb political tensions and dissipate social pressures. When climate change is presented as a comprehensive security nexus, demanding widespread adaptation, one can question the room for manoeuvre that actually exists.

Many had hoped that science and the challenge of climate change would do what politics has hitherto failed to achieve, that is, force an equitable redistribution of the earth's resources and genuinely sustainable patterns of existence and trust. The long

history of one-sided World Trade Organisation (WTO) negotiations, plus the failure of the world summit on climate change in Copenhagen in December 2009, is a reminder that these aims remain elusive. Instead, if we cast an eye on recent history, including the rise of liberal interventionism and militarism in defence of civilisational values, a more likely response to climate change is a continuing bunkerisation of the global North. The architecture of bunkers and camps gives important clues to how, in social-ecological terms, the world is defensively fragmenting. Global cities and elite regions will continue to forge special arrangements, modes of privileged interconnection and private provision in a world where ecological services are becoming scarce and increasingly seen as a central to national security. Under the impact of climate change, rather than a new deal, the global civil war seems set to intensify.

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