

On Urban Failure

Ash Amin

Introduction

Keywords are powerful words. They clear a way through the complex and opaque. They name the important and urgent. They guide action. Think of how 'Anthropocene', the disputed term for a geological epoch inaugurated by human industry has fast established the idea that we stand at the edge of destruction because of the irretrievable damage done to the earth and its corrective systems by the heavy human footprint. The term has become a 'paradigm dressed as epoch' (Baskin, 2015: 9), in the way of 'globalisation' a few years earlier announcing the transition from a territorially organized world to one structured around free markets, global flows, and transnational authority. An aspiring new entrant suggesting a course through the brittle future is 'smart cities', intended to bridge two realities. One is the growing world prominence of cities, as they come to house two-thirds of the world population, make world culture, creativity and political economy, generate the bulk of carbon emissions, and shape developments in the non-urban world through the supply and communication chains they control (Amin and Thrift, 2016; Brenner, 2014; Burdett and Rode, 2011; Taylor, 2013). The other is growing urban vulnerability, manifest in the threat posed to life amassed in cities by global warming, uncontrolled technologies, capitalist profligacy, dangerous pathogens, and geopolitical instability; a vulnerability compounded by innate urban fragilities such as congestion, pollution and sprawl, infrastructural complexity and failure, and social stress and inequality (Amin, 2013).

'Smart cities' is an aspiring keyword premised on the possibility of an urban intelligence able to manage urban complexity as well as anticipate hazard and uncertainty. It proposes the closely monitored wired city: software-governed infrastructures and habitats sending large real time data to computational systems and models able to map the complex city and generate credible scenarios to city leaders, systems providers and research laboratories working closely with each other to continuously adjust the urban through the intelligence gathered (Department of Business, Innovation and Skills, 2013; Institute for the Future, 2012). It offers a way of thinking global and urban turbulence as governable – the urban age managed for world prosperity, security and sustainability. Like Anthropocene, the term is disputed, considered by its critics as a conceit of science and technology that will struggle to deliver its promise, unable to reign in the living city's many information

anomalies and knowledge gaps, governance resistances and frictions, functional autonomies and unpredicted developments (Townsend, 2013). It is also accused of underestimating the richness and necessity of social response and lay knowledge in addressing hazard, uncertainty and risk (Greenfield, 2013), and of generally stupefying the urban imagination (Sennett, 2012). To this can be added that its precepts and propositions are hardly neutral or technical, but profoundly political. They glorify the cities that invest in smart technologies and smart governance, regardless of efficacy and slippage into surveillance. They lean on hard-pressed cities to incur debts to fund expensive intelligence systems and expertise, fearful of losing out on future credit and investment. They hand over cities to a new technocracy masquerading as adjunct to government. They tarnish cities 'stuck' with basic technologies, social intelligence, and rudimentary expertise as out of date and ineffective.

Yet academic exposure of the flimsiness of the concept will not dent its circulation as a keyword. After all, it recommends smartness not stupidity, and a clear course of action for cities to pursue. It has all the sheen of utopian urban projects that have captivated publics and planners in the past. It presents a simple slogan around which decision makers can rally, showing that they have found a way of tackling risk and delivering the promise of the urban age. It apprehends the future as manageable, in the process glossing over genuine dangers and vulnerabilities, downgrading honed responses that do not fit with the mantra. It allows attention to stray from the closeness of cities to danger and misfortune, from daily practices of mitigation, maintenance and repair, from other forms of anticipatory and preparatory knowledge in the city, from the improvised and experimental in keeping up with a constantly changing urban environment. It glosses over urban realities that are central in shaping the ability of cities to negotiate ontological risk and uncertainty.

This paper works with these realities by foregrounding the idea of urban failure, in the belief that collective dysfunction is what cities everywhere daily confront as complex open systems facing constantly evolving and uncertain circumstances. This risk is experienced in different forms and intensities and is met with different degrees of success. In order to acknowledge this variety and the lived practices of risk mitigation that defy easy categorization, the term is not deployed as an alternative keyword. Instead, it is offered as a proposition: that cities are imperfect machines of coordination poised on the edge of failure, but able to stave off collapse because of accumulated, largely machine, intelligence. This mitigation capacity, however, always involves omissions and sacrifices. Smartness, from this perspective, is about systems integration and coordination, and in service of distributed protections and

capabilities, but without pretensions of total oversight and control, and not about preparedness based on perfect computational intelligence.

Close to the Edge

With so many types of city in the world existing in so many different states, it would take some courage to fit them into a singular symptom. Yet there is no shortage of such thinking, making light of context and specificity. Typically, on the negative side, cities are imagined as places of dissent, surveillance and militarisation in the world after 9/11, as sites of population concentration vulnerable to the vicissitudes of climate change, inadequate provisioning and social dislocation, or as spaces that are hard to govern because of their size and complexity. On the positive side, cities are portrayed as the world's nodes of creativity and learning, consumption and competitiveness, supply and circulation, and power and authority. They are seen as world making in every respect. Though these summaries are rarely intended as descriptions of all cities or an entire city, they set out the measure of things – the cardinals of fear of aspiration, the kind of city that Lagos or London is, the interventions needed to improve urban prospects. The city of symptoms displaces the city of situated practices, and with it, the need to understand how cities negotiate risk, adversity and opportunity in their own ways, and with different degrees of success. The liveliness of urban process, the detail of the labour involved in urban maintenance, tends to get ignored.

This is not to say that the narrative of symptoms has no general value. The negative narrative, for example, lists enough dangers for most cities to be concerned. The devastation caused by hurricanes such as Katrina in New Orleans and Sandy in New York is a warning that even the most prepared cities are not exempt from the kind of wreckage regularly heaped on less resilient cities in the South by the 'storms' of climate change. Port au Prince and Dhaka are no longer exceptions. So it is with the urban focus of terrorist attack, considering that the list which includes New York, Nairobi, Madrid, Bombay, London, Istanbul, Paris, and Brussels proves that cities of strategic or symbolic importance anywhere in the world are at risk - their defence systems unable to prevent the assaults, their populations and leaders left disarmed and fearful, their legacies of intelligence and preparedness torn asunder. And the same can be said for the vulnerability of most cities to mutating pathogens testing even the most comprehensive monitoring and protection systems. If the cities with the most advanced systems have managed to stave off large-scale loss until now, this may not be for long, as it gets easier for pathogens to spread globally, as the limits of emergency planning and health care are reached, and as the elaborate social and physical morphology of cities defies detection and prevention.

These threats are compounded by problems of infrastructural overload, another common urban symptom. Cities depend on the effective circulation of capital, information, knowledge, commodities, and metabolic necessities, but trunk infrastructures supplying water, electricity, information, transport and the like are expensive to build and maintain. Exponential urban growth has been accompanied in most cities of the world with insufficient investment, constraints posed by the built environment and property regimes, and regulatory failings including inadequate or poor public management. The resulting infrastructural failures and congestions, sharpened inequalities of distribution, and rampant profiteering from lack have become commonplace, with acute consequences for poor urban majorities in the South already facing multiple deprivations such as unemployment, ill health, violence, insecurity, bad housing and lack of income and opportunity. This coupling of large-scale social deprivation and large-scale infrastructural malfunction is a warning to governments and elites everywhere. The explosion of urban unrest in North Africa and the Middle East may be a foretaste of what is to come in cities plagued by the many forms of market, military, or authoritarian adventurism in the world today, but also those in the North confronting neoliberal austerity, as the popular uprisings in Athens and Madrid show.

The negative narrative portrays a failing urban world and it judges the provisioning systems of cities to be inadequate, even accentuating the challenges of risk society. It makes the positive narrative extolling cities as cradles of prosperity, creativity and civilization (Hollis, 2013; Glaeser, 2011; Kasarda, 2012) seem ingenuous, a detraction from the very real need for cities to prepare against hazard and uncertainty. It resonates with the experiments of risk mitigation in cities with formal urban planning procedures, including attempts to wire up the city, improve anticipatory intelligence, sharpen surveillance and policing, improve infrastructures and services, control migration, reduce carbon emissions, build flood barriers, and raise public awareness and resilience. Sometimes this variety and its definitional ambiguity plays to a politics of urban protection seeking not only to tackle real risks and hazards, but also reorient the city towards particular interests and dispositions in the name of risk mitigation, with decidedly unpleasant outcomes for subjects deemed to be suspicious, dangerous, or unable to protect themselves (Amin, 2012; Graham and McFarlane, 2014; Owen, 2015). The perception of cities at risk folds easily into a selective biopolitics of mitigation.

Despite the shortcomings of symptomatic thinking, it is not unproductive to think of the urban present as precarious, and that cities are poised on the edge of failure. But it is wise to stretch only this far, for urban failure is not than common and rarely total

because cities are not inert entities. As Vale and Campanella (2005) have observed, very few cities have disappeared in the course of the millennial history of urbanization. Most have learned to anticipate danger, limit damage, and recover from destruction. This is not to diminish the devastation they have faced from war, disease or famine, infrastructural failure, blocked supplies or governance failure. Nor is it to suggest that recovery has been free of costly losses and sacrifices, or that cities have emerged more resilient and in fairer ways. And some historic cities have indeed failed to survive. However, the kind of total collapse that Jared Diamond (2005) writes about when tightly-knit societies find their relatively homogenous wisdoms caught out by adverse circumstances, tends to be avoided by cities because of their constitutive plurality, including the heterogeneity of their knowledge practices. This can be proposed at least as the principle behind failure averted, whose efficacy I wish to suggest, however, depends on the character of a city's regime of risk anticipation and management, including the rules of expertise and government and the rituals of urban maintenance and repair. It is this automaticity that validates or suppresses the plural wisdoms of risk anticipation and mitigation, the breadth and depth of urban failure.

Saving the City

This automaticity is barely acknowledged in the mounting literature on urban risk mitigation and disaster management, in which the emphasis falls squarely on the qualities of expertise, government or civic behaviour. The capabilities of thinking/acting humans and their institutions are placed decidedly in the foreground, with scant attention paid to enabling or underlying urban infrastructures. This is especially so in work focusing on civic preparedness, which observes a surge in social altruism during emergencies and disasters, in the form of donations, volunteering, and heightened mutual support among victims. Confirming much of this in her review of major urban disasters in Europe and the Americas over the last century, Rebecca Solnit (2010) goes so far as to suggest that urban recovery should be led by citizens and civic associations, with government urban planners and experts following in tow, rather than the other way. Her claim is that the social energy typically released during an emergency would not dissipate if communities felt empowered (in contrast to the usual practice of being undervalued or crushed by governments and elites), eventually offering cities a base of distributed intelligence and capability to address future hazard.

The irony, however, is that many cities in the majority world - confronted by a mix of official mismanagement, failing infrastructures, limited resources or expertise, and self-serving elites - *do* rely on social energy to deal with daily and exceptional hazard,

but the consequences are not quite the same as those imagined by Solnit. Social creativity and altruism are entangled with and constrained by the crushing weight of poverty and lack, the intense scramble for resource and opportunity, the pressures of self-survival in an unforgiving urban environment, and the suppression of civic organisation by authorities, elites and powerful social groups. In these circumstances, it is the full spectrum of human affects that prevails, including anomie and animosity, not just care among strangers. Solnit acknowledges the possibility of negative affects during an emergency, noting for example, the escalation of selfish and feral behavior during the Katrina crisis in New Orleans, but chooses to explain them as a backlash against excessive vilification or curtailment of the public by the authorities and the media, confident that they would evaporate in the city of distributed power and social recognition. This confidence strikes me as speculative, an underestimation of the many constraints on social power in cities of mass inequality, poverty and rudimentary provisioning, of how extreme human vulnerability, institutional fallibility, and material precariousness disables communities as the primary source of urban repair and recovery.

Where circumstances place the onus of survival on inhabitants, the ensuing social practices – atomistic or collaborative – are not necessarily an effective and sustainable buffer against adversity. The literature on how people in informal settlements live with risk is revealing in this regard. If the early studies of contemporary slums saw them as places of multiple deprivation and precariousness crushing the social agency of their inhabitants (Davis, 2007; UN-Habitat, 2008), recent writing has been more forgiving, finding more than the hapless victim in the slum dweller. Some observers, echoing Solnit, discover resourceful people grasping opportunity against all the odds and sharing to make ends meet and secure better prospects (Saunders, 2010; Neuwirth, 2005). The more detailed ethnographies, however, tend to find that human vulnerability and resilience are closely intertwined, such that the ability of slum dwellers to withstand adversity is constantly undermined by the sheer weight of existential challenges faced, from the lack of access to work, services and connectivity, to the oppressions of law, authority and clientelism. A good example is Katherine Boo's (2012) celebrated ethnography highlighting the daily swings between abjection and achievement in Annawadi located near Mumbai's international airport (see also Wamsler and Brink, 2014, on why diverse social coping and adaptation strategies succeed or fail).

In turn, work on material culture in informal settlements finds that technologies, habitats and infrastructures are implicated in the making of social subjectivity. The experience of accessing water, electricity and sanitation, of living in makeshift housing and improvised public spaces, of relying on cobbled together technologies to

make ends meet, of negotiating particular atmospheres of place in order to get by, is shown to be involved in regulating the balance between anomie and altruism, initiative and apathy, hope and despair (Amin, 2014; Simone, 2014; McFarlane, 2013; Sundaram, 2010). The studies reveal the materials of everyday life to be part of the sensory and affective field – the immersive environment on the inside of human thinking and feeling – and not just external object domains shaping social behaviour through their consumption. This broader understanding of social being is echoed in another body of writing that traces the qualities of human capability in informal settlements to the politics of recognition: the legal and institutional recognition of residency and citizenship rights, the ability of the poor to organize, the strength of social movements, the power practices of authorities, adversaries and gatekeepers (Appadurai, 2002; Chatterjee, 2008; Holston, 2008; McCann, 2013; Satterthwaite and Mitlin, 2014). It is the balance of instituted force, formal and informal, that is shown to shape the strength and character of the social agency of the poor. In short, such research on materiality and micropolitics reveals that social capacity in the city is not reducible to innate or honed human inclinations, to the parables and practices of ‘community’.

To find that associational hybrids of various kinds are involved in shaping human vulnerability and resilience in the lived city is to also decentre accounts of risk mitigation emphasizing particular forms of urban expertise and government. This includes the narrative of smart cities, with its faith in arrangements for extensive technological intelligence to capture real time developments, expertise in complex systems and non-linear modelling to anticipate the turbulent future, emergency planning based on close ties between science, expertise and government, risk awareness and vigilance in all quarters to prepare for the inevitable, and smart infrastructures able to regroup quickly from damage. In this faith, the tradition of top-down urban planning is updated for circumstances held to be volatile and dangerous, by extending the intelligence base and by making strategic decision making faster and more collaborative. There is no flaw in the principle that the threat of urban crisis or failure should be addressed by a closer relationship between science, expertise and government. Who could find fault in this? The question, however, is whether such planning will succeed, and if the assumption is that it can wield independent authority over the city then the answer has to be more circumspect. This is because the city is no inert entity managed from the outside, but a lively sociotechnical system full of its own intelligences and arrangements that not only alter the actions of collaborating scientists, experts and managers, but also enroll these actors in ways that stray from paper intentions.

Machine Culture

Cities are distributive systems - vast intersecting networks of infrastructure with their own organizational logics and their own powers of allocation and influence. These networks, including supply chains and transport and communications grids, financial, welfare and metabolic systems, and the array of materials and technologies that make up the built environment, make up the city. Their zygotic knot is the urban ontology, it could be said, and their combined agency the machinic force that keeps the city on the move. Nothing much in the city and beyond can happen without these networks, and not a lot can exist outside of the infrastructural constellation. It instantiates city life, shapes the condition and distribution of wellbeing, and defines urban culture through its inhabitation.

The automaticity of urban sociotechnical systems, however broken or robust, makes urban life in all its senses (Batty, 2013). This is all too evident when infrastructures fail, though often not explained in terms of the explained in terms of this automaticity (Graham, 2010). Fukushima, the hurricanes battering Haiti and west coast US cities, the wars tearing apart cities in North Africa and the Middle East, the regular blackouts, floods and building collapses that plague cities of the South, the urban congestion and transport gridlocks facing cities everywhere, the terrorist attacks on world cities are timely reminders of the devastation caused and sustained by infrastructural incapacitation. As infrastructures get painstakingly restored – or not – the dependency of so many and so much on the regularity of everyday urban provisioning is thrown sharply into relief. The time of paralysis and recovery shows how much urban failure and urban repair are tied to the state of a city's sociotechnical systems, to the silent whirr in the background of the machinery of urban maintenance, the labour of a bewildering array of entities-in-relation – manuals, programmes, codes, people, institutions, conventions, corporations, intelligent machines, software, data and materials – that make for awareness, circulation, provisioning and industry.

Knowing the detail of the sociotechnical systems matters - their character as vast, accreted engineering complexes of varying robustness and resilience, as interest-laden distributional networks, and as culturally formative (Graham and McFarlane, 2014; Simone, 2015). We are beginning to understand these wider connotations from the so-called infrastructural turn in urban studies. Its studies of water, transport or electricity in Mumbai, Lagos or Rio de Janeiro reveal the urban fortunes at stake, the sharp inequalities of supply, the improvisations forced upon the poor by lack, the war waged between residents, elites and corporations over scarce resources, the chains of life poised on the fragility of tired and overstretched infrastructures (McFarlane, 2013; Farouk and Owusu, 2012; Björkman, 2015; McCann, 2014). Its

studies of smart technologies to closely monitor the urban environment, show surveillance and policing to be close in train, and when plagued by technical and coordination failures, still exercising considerable symbolic weight over city leaders and planners (Townsend, 2013; Greenfield, 2013; Halpern, et. al., 2103). Its studies focusing on the cultural resonances of infrastructure, reveal the captivating force of big engineering and architectural projects even when they don't deliver to expectation (Harvey and Knox,), the ways in which city dwellers think, act and feel through everyday technologies that are getting increasingly smarter and intrinsic to the human experience in cities (Thrift,), and how the semiotics of the urban landscape, from signage to smells and soundscapes, work on public feelings and dispositions (Anderson, 2011; Hirschkind, 2011; Henshaw, 2014).

These infrastructural reaches are not coincidental in defining urban vulnerability and resilience (Owen, 2015; Denis and Pontille, 2014; Ash, 2013). There is, most obviously, the technical robustness of a city's sociotechnical systems, which in turn is tuned to protect some urban spaces and subjects more than others. City engineers and architects know this only too well, as do militaries and dissidents intent on incapacitating a city by disabling its transport, communications and energy systems. The technologies and routines of maintenance, repair and renewal, materials fabrication, system integration and circuit isolation, demand management and spare capacity, and foresight and planning, are crucial determinants of the capacity of a city to withstand adversity. They are the material on which cultures of risk perception and management are tagged, and most importantly, they are the machinery through which decisions are enacted, consequences amplified, and returns prolonged. If in market-driven Russia poor townfolk unable to afford heating manage to secure some heating during the harsh winter, it is because the Soviet technology of energy distribution from municipal generating plants makes household-based isolation difficult, and keeps alive a legacy of universal provisioning creatively managed by municipal officials to heat homes scheduled to be cut off (Collier, 2011).

I am not suggesting that culture is slave to technology or that the relationship between the two is a straightforward one, but the interdependencies are clear. For example, in the early 20th century, Manchester moved quickly to tackle the hazards posed by untreated sewage pouring into its clogged waterways by embracing the new science of bacteriology to treat wastewater because of the authority of scientific experts in policy formation, while in Chicago, facing the same problems, powerful self-serving politicians managed to block the treatment for nearly three decades, doggedly questioning the scientific case (Platt, 2004). There were all kinds of mediations at work, but the links of technology and culture were unmistakable. As the bacterial treatment of wastewater spread worldwide and the technology became

the standard of urban sanitation, so too grew its status as symbol of responsible urban stewardship, allowing easy judgment of different sanitation systems as both hazardous and morally wrong. Urban 'technological frames' (Bijker, 1995) are governance regimes that incorporate world-views, professional conventions, ways of thinking, and policy practice associated with particular scientific and technological arrangements. They are part of the machine culture of urban preparedness, the encrustations of technology and culture resistant to radical change, yet endowed with the 'dynamic inertia' of tried and tested adjustments to long histories of exposure to hazard and risk (Hommels, 2005). They are both honed and fragile resilience machines, keeping cities from daily failure but also capable of causing large-scale damage when exposed.

Either way, this machine culture is the passage point and test of diverse proposals to prevent urban failure, including recommendations of vigilant communities, smart technologies and expert government. It is the worked material of urban preparedness that both precedes and exceeds the proposals, expecting analysis of urban vulnerability to consider the technicalities, political economy and cultural power of system automaticity, for its robustness is key to how far and fast hazards translate into urban failure and how quick and extensive recovery can be. This means getting to know the provisioning dynamic and robustness of a city's assemblage of transport and communication, water, energy and sanitation, housing and the built environment, security and emergency management, and information and knowledge. It means parsing proposals through this assemblage, by making them 'charismatic' so as to create 'social drama' behind them (as Kim, 2013 shows for the steps behind the success of pioneering flying machines), by attending to coalitions and alliances that ensure their translation and transmission, by making them seem like knowledge from the street and established forms of expertise (Dierig, Lachmund and Mendelsohn, 2003). The effort to build urban resilience requires constructing a field of influence that is of the field itself.

But even this is no guarantee of success, for the techno-cultures talk back, spitting out innovations or incorporating them in ways that alter intentions. The history of urban reinforcement is riddled with failed innovations and unintended consequences, not only because of insufficient attention to translation and transmission, as Bruno Latour (1993) has shown for Aramis, the experimental rapid transit project of the late 1960s intended to convey cars like trains across Paris. It is also because of the liveliness of embedded infrastructures, for example, 'smart city' interventions coming unstuck because of host systems becoming overloaded with information from sensors placed everywhere, presenting a hinterland of crusty infrastructures behind the smart monitoring technologies, falling prey to surveillance agendas before risk

modeling ones (Halpern et. al., 2013). The material of past preparedness intervenes. So does the material of new interventions in unexpected ways. The extensive concretization of Hong Kong after the 1960s to stop the frequent landslides caused by its decomposing granite base, as advised by then cutting-edge geoscience, set in train a motion of property speculation serving the city's elites, pushing out the poor to the vulnerable geo-margins, and killing off the soil on which the future of the entire city hangs (Bobbette, 2015). Short-term resilience can turn into long-term vulnerability when the foresight is lacking or when the interventions are expedient in narrow ways.

Failure Short of a Keyword

To think of cities in terms of failure is to recognize their vulnerability to today's many global hazards and risks, and to acknowledge that they are hard to manage as complex open systems. Given the comprehensive urbanization of human settlement, and with cities shaping so much of what goes on in the world, the potential and cost of urban failure is set to be high. Yet, the history of cities is one of continuity, recovery and regeneration, albeit with not inconsiderable losses, conflicts and divisions. My argument has been that this capacity to keep back from the edge of the abyss has everything to do with the agency of the socio-technical systems that are the city. They enable large-scale distribution, regulation and maintenance, regardless of their state of repair, and they do this more or less effectively. They are constantly reworked, through a combination of improvisation and innovation, patchwork repair and overhaul, and planning and auto-adjustment. It is through them that intentional and vernacular knowledge must pass for validation and amplification. Practices of intelligence, security and distribution embedded in the city's machine culture regulate the preparedness of a city to hazard and risk.

Viewed in this way, the term urban failure lacks the convening force of a keyword in the sense alluded at the start of the paper, for it signals no general truth or momentum. It does not lend itself as a master category like globalization or Anthropocene, or for that matter, other similar categories of 'failure', such as 'market failure' or 'state failure'. If such references to failure are laden with directional muscle, including ideological condemnations of practices that do not fit with hegemonic fictions of requisite organization (in this case market freedoms and states in tow following particular scripts of behaviour), the heuristic of 'urban failure' in this essay alludes to a possibility both exacerbated and tempered by the ontology of the city as an assemblage of assemblages. The term is indicative, but serious, privileging neither certainty (of urban failure or mitigation) nor a preferred mode of urban organization and government. Indeed, quite the opposite, by cautioning against a

rosy vision of cities and their world-saving qualities, against ideologies of risk, smartness and resilience premised on particular applications of science, technology and government, and against any presumption of only human ordainment of urban affairs. Its intention is to wrest the discussion of urban failure away from the dominance of such thinking, with its denials of urban fragility, or its confidence in managerial interventions and superior forms of intelligence, or its keywords such as 'smartness' or 'community' or 'vigilance' that automatically cast urban states and responses that do not fit as 'stupid' or 'backward'. In discussion on urban failure too there are master categories imposing a standard that the more pragmatic term here seeks to puncture and displace in order to reveal another urban condition.

This is a condition of adversities whose severity and duration depends on and is tempered by the machine culture of cities. The heuristic that encapsulates it does not forecast imminent and inevitable urban collapse at a turbulent time as if the fabric of the city were inert, but instead foregrounds the immanent and conditional in the form of the hidden liveliness of urban infrastructures – tagging the nature and scale of failure or recovery to the technical, aesthetic, political and cultural qualities of the infrastructures. This inclination to tread the contingent is not to suggest that honed techno-cultures of preparedness are up to the task, for they can defect in so many ways, by failing, becoming outmoded, serving particular interests, falling into disrepair, getting overloaded, developing lives beyond provisioning and risk mitigation. If the machine culture of cities tempers failure, it does so imperfectly, as is so evident from the acute and persistent problems of urban vulnerability across the world. Nor is it innocent, as we know from writing on the history of urban infrastructures as a history of population management - the inventions of mapping, lighting, sanitation, surveillance, and architectural design shown to govern for distinctive, and usually uneven, biopolitical ends far exceeding the immediacies of keeping the city of the move, defending it from adversity (Joyce, 2013; Collier and Lakoff, 2015; Amore, 2013; Graham and McFarlane, 2014; Lancione, 2015).

The perspective on urban failure I have offered presents a policy paradox, caught between action of a certain kind and limits posed by machine culture. On the side of the possible, a fashion for smart technologies, smart people or smart government is deemed inadequate, however joined up and however well managed, because they ignore the vast urban hinterland that forms the ground of urban preparedness. I have used different terms to describe this hinterland – lively infrastructures, machine cultures, socio-technical systems – to get at the vitality, intelligence and salience of mundane networks of transport, water, electricity, shelter, care, security, and so on, in dealing with urban vulnerability, successfully or otherwise. Accordingly, it may be that building the resilient city is about planning for capacious, responsive, equitable

and repairable infrastructures, a task requiring diverse actors - engineers, architects, sociologists, planners and publics – to collaborate as equals to ensure material robustness, systems compatibility, constancy of supply, and distributional fairness. This requires a politics of the urban common ground in order to better manage the dispersal, flow and coming together that is the city, and in order to ensure readiness for the adverse or unexpected, for example, by building excess into supply chains. It also requires a politics of distributional fairness so that the ubiquity of the city is matched by a similar ubiquity of social and spatial preparedness. Isn't this what social democratic urban planning once intended, even if not couched in the language of risk mitigation? Isn't this what *laissez-faire* has so dangerously compromised by privileging the immediately profitable and exhaustible? Isn't this what folk understanding of urban failure is about, contra the designs of experts and managers, based on the very real experience of infrastructural exclusion and associated frustrations of housing, water, energy, health, education, insurance, connectivity, and mobility?

Focusing on machine culture, though, requires being clear about the limits of policy action. The hinterland is a world of hidden interacting intelligent systems with their own evolutionary dynamics (Thrift, 2014). The systems are largely opaque, their logic and yield is relational and non-linear, and they are almost self-governing as assemblages of human and technological intelligence. Making them visible in the way Kevin Lynch (1960) wanted in the 1950s by proposing transparent buildings and infrastructures so that they could be redesigned, or in the way smart city enthusiasts aspire from the 'big data' of ubiquitous computing, only registers their presence. It does not make them straightforwardly manageable. There is only so much urban policy can do or direct, because in the mangle of the machine culture, interventions get modified, rejected, attached to unintended targets. There is no inert ground that policies can pretend to rework at will towards planned goals, only an active material field that pushes back.

Accordingly, a politics of ground preparedness has to be modest and immanent in its expectations, focusing on system design rather than operational detail, aligning a myriad of actants, making for repair and maintenance, adjusting to changing circumstances, accepting that policy failures and departures are inevitable, an opportunity to reassess and learn. This is a politics of improvisation and adjustment in the dark, of cultivating the field in ways that others can act, of underwriting machine responsiveness. The smartness here has to do with acknowledging the intelligence of what has gone and goes by in the urban fabric, placing policy at its service (Gandy, 2014). This intelligence and its systems always remain elusive, excess to projects to 'reveal' them, powered forward by their own durations. The

experimented histories of the urban machinic unconscious (for this is what city systems are) question the presumption that today's cities face exceptional risk circumstances, and point to an urban technostucture that has always existed to mediate the balance between vulnerability and resilience in the city. We are challenged to understand how these durations are formed, and how they might become allies in tempering the furies of the Anthropocene. We are reminded that this machine does not need a technological fix, but care-full and constant curatorship of its socio-material relationships. These allusions may lack the surely and luster of master narratives of urban failure, but heeding them might prove to be more effective in keeping cities on this side of the brink.

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