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Informal Settlement and Assemblage Theory

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INTRODUCTION

Much has been made of the fact that most of the global population is now urban, up from about 30 percent in 1950 and rising. It is not so often noted that most rural-to-urban migration has been accommodated in informal settlements, outside the control of the state and without the engagement of built environment professions. Over a billion people now live in 'informal' settlements that are permanently incorporated into the 'formal' city with no prospect of wholesale erasure and replacement. While partially synonymous with 'slums' and 'squatting', 'informality' is not a condition of poverty or lack of tenure so much as a form of urbanity that emerges outside formal urban planning frameworks. Informality is a means of managing poverty. The most effective upgrading processes are *in situ* and incremental – working with residents in a manner that acknowledges existing assets, income flows and public space networks as well as micro-spatial processes of adaptation, incremental construction and micro-financing. Such processes entail the development of formal urban planning codes for light, ventilation, sanitation, construction, open space and density. While slum upgrading is a kind of formalization, it cannot be achieved without harnessing the informality that has produced and sustained these self-built cities.

In this chapter, I seek to re-think the relations between informal/formal urban practices and forms utilizing a theoretical framework of assemblage thinking. Assemblage theory, deriving largely from the work of Deleuze and Guattari (1987), embodies a series of twofold concepts – rhizome/tree, smooth/striated, supple/rigid, becoming/being – that resonate with the informal/formal conception. This focus on a rethinking of interstitial conditions, the dynamic 'between' conditions of urban life, makes assemblage thinking a useful theoretical toolkit for engaging with the challenges of urban informality. Assemblage is both noun and verb, both a theory and a way of thinking; suggesting that the goal of intellectual work is to produce concepts as tools for thinking, teaching us how to think as much as what to think. The point is to find better ways to practice thinking more than to make a theoretical point. The practical challenge lies in the deployment of conceptual tools in professional practices of urban development and slum upgrading. To engage effectively with the conditions of informal settlements has significant implications for urban research, urban planning, urban design and architectural practice. Traditional forms of urban theory and practice – focused on formal regulation and top-down plans – have proven poorly equipped to cope with the dynamism, complexity and resilience of informal urbanism. In terms of research this requires an analysis of where such settlements emerge and why; an understanding of the morphology and dynamics of how they work – the spatial patterns, construction systems, increments of change and informal codes. The challenge is to develop multidisciplinary and multi-scalar methodologies to explore the ways in which urban informality is linked to squatting, corruption and poverty on the one hand, but also to growth, productivity and creativity on the other. I will first make the case for incrementalism – a range of reasons for this shift in thinking. This will be followed by an outline of assemblage thinking and its relations to complex adaptive systems theory as a framework for re-thinking these issues.

## THE CASE FOR INCREMENTALISM

Informal settlements occupy land that is interstitial and of marginal use – the leftovers, the *smooth* space, the *terrain vague* of the city (Dovey and King, 2011). Primary sites include urban waterfronts and escarpments, but also the interstitial easements lining transport infrastructure of freeways and railways (as shown in Figure 30.1). They can infiltrate ex-industrial and ex-institutional enclosures and flourish in the backstage spaces behind formal street walls. Large slums such as Dharavi in Mumbai, Rocinha in Rio de Janeiro, and Kibera in Nairobi are important exceptions to this interstitiality where informality saturates a larger district (Dovey and Tomlinson, 2012).

Informal settlements are often rendered invisible to the gaze of the formal city. Formal street atlases show them, if at all, as shaded zones without streets or names. Informal settlements are quite literally 'off the map' of the formal city (Robinson, 2002) or deliberately erased from the gaze of the formal city (Shatkin, 2004). While they may seem marginal they are not marginal to these cities in economic terms (Perlman, 1976). They emerge in such difficult interstitial locations because they have access to jobs and public transport. Slum-dwellers service the formal city where they are often a third of the workforce. Any strategy that suggests they be moved to cheap land on the urban fringes will fail because it exacerbates poverty and strips the city of its workforce. With few exceptions, informal settlements need to be upgraded *in situ*.

Informal settlements embody informal practices of sociality and economic production that are not easily retained in a transformation to formal housing. There is a particular dependence on the street and laneway network, particularly the capacity for domestic production to spill into public space with high levels of intensity and efficiency. Formalization often standardizes private space in tiny apartments that are separated from street networks, producing access spaces that are less flexible and productive (as shown in Figure 30.2). The sociality and productivity of informal settlements is highly dependent on the capacity of public space to absorb domestic and economic functions.

Formal replacement (including public housing) can play an important role in the case of slums that cannot be rehabilitated to a
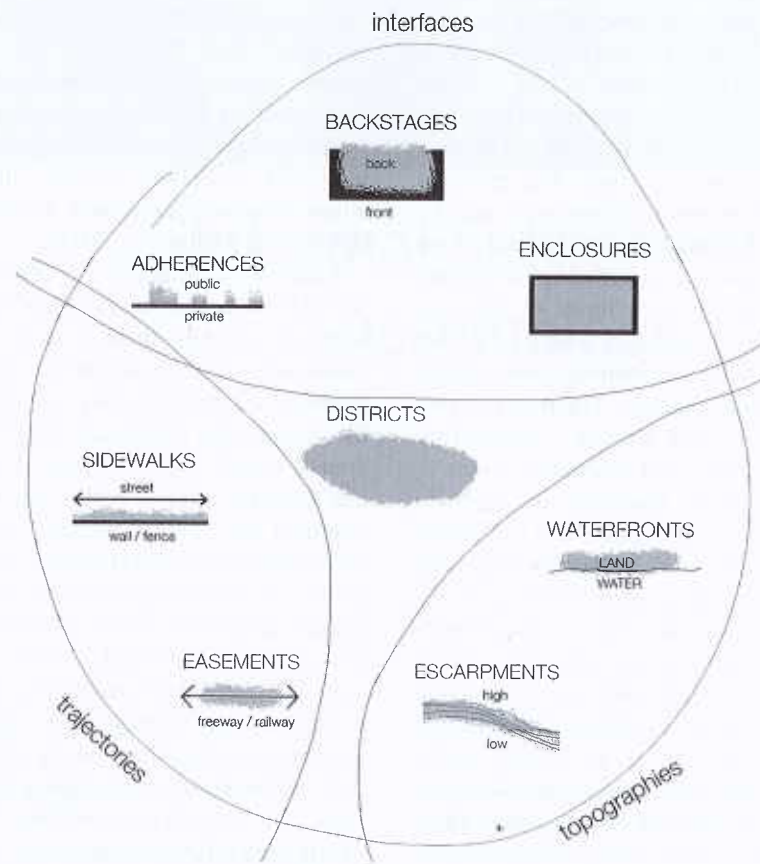
Figure 30.1 A typology of informal settlements

Figure 30.2   Productive laneways and formal replacements, Dharavi, Mumbai, 2011

livable standard, or where the location cannot be rendered safe and sustainable, but any model where the poor simply become welfare clients is not viable. So-called 'squatter' settlements are often defined by the original encroachment on formally 'owned' land, yet tenure often becomes ambiguous, irregular and contested rather than strictly illegal (Durand-Lasserve, 2006; Jenkins, 2006), the houses are generally owned by the residents who built them and who may also become landlords. Many slums contain high-quality construction that comprises a major asset (Hernandez and Kellett, 2010: 14). In the case of Dharavi, many residents own houses of up to four rooms, some of which are rented for either housing or industry. Plans

for wholesale formalization meet stiff resistance because this often entails a loss of jobs, converts homeowners into tenants, and leaves the former tenants homeless (Dovey and Tomlinson, 2012). High levels of informality enable micro-flows of information, goods, materials and practices that produce income and make life sustainable under conditions of poverty. These practices are integrated with the micro-spatial adaptations that flourish under conditions of informal urbanism – particularly incremental construction processes. Informality is not to be confused with poverty; it is indeed a resource for managing poverty.

Informal settlements are relatively high density, walkable, transit-oriented and car

free. They are often constructed from recycled materials with low embodied energy and passive heating/cooling. The narrow pedestrian lanes of informal morphologies embody a deep-seated spatial resilience against car-dependency. While many settlements need greater access for emergency services, in most cases this can be achieved by adapting those services rather than demolishing the narrow streets. If they can be both upgraded and better connected with public transport then they can morph into the very kinds of dense, safe, walkable and integrated neighborhoods that urbanists in formal car-dependent cities often dream of. Many such settlements have emerged where they are because they already have walkable access to transit and employment. While any effective upgrading will increase consumption, to upgrade a billion slum-dwellers to Western levels of consumption, or move them away from transport and employment, would be catastrophic. The task is to integrate an incremental upgrading process at the micro-scale with larger-scale designs for a low-carbon and transit-oriented city.

There are also aesthetic reasons to retain the basic morphology of informal urbanism – a difficult issue to deal with briefly while avoiding the charge of an aestheticization of poverty (Dovey and King, 2012; Roy, 2004). Favelas were the subject of aesthetic interest (for Le Corbusier and others) from the early twentieth century, and much of the interest in 'architecture without architects' from the 1960s was based on potent images of a vernacular aesthetic. Stripped of any evidence of poverty, such images demonstrated how an informal order emerges from a repetition of types and materials variegated by an incremental adaptive process (as shown in Figure 30.3).

In cities such as Mumbai, Bangkok, Cape Town and Rio de Janeiro, there is a burgeoning industry in slum tourism (Freire-Medieros, 2009; Frenzel et al., 2012; Jaguaribe and Salmon, 2012). Urban informality can be picturesque with elements of nostalgia and a quest for authenticity. It also brings elements of the sublime, the shock of the real, a spectacle of hyper-intensive urbanity and an uneasy voyeurism (Dovey and King, 2012).

Figure 30.3   The picturesque slum, Medellin, 2014

Informal settlements often embody the mysterious intensity of the labyrinth – a place that is impenetrable and disorienting to outsiders, but permeable for residents. These are multi-functional spaces where every scrap of sunlight, material and space has a use. Benjamin and Lacis (1978 [1924]) identified the slums of early twentieth-century Naples with the urban quality of 'porosity', where the spatial and social segmentary of the city dissolves; where the interpenetrations of buildings and actions 'become a theatre of new, unforeseen constellations'. The labyrinthine street networks of informal settlements can be considered as part of the heritage of the city, embodying a history of each neighborhood that should be upgraded rather than erased. Indeed, some heritage zones of formal cities, including tourist attractions, have street morphologies that are remnants of informality and squatting.

Having made this case for incrementalism, there is no shortage of good thinkers who attribute the global growth of slums to the excesses of neoliberal capitalism under conditions of a weak state, and suggest that slum eradication is impossible without macro-political and transnational transformation. There are important arguments against incrementalism in this regard. As summarized by Davis (2006: Ch. 4), they are that self-help schemes so often fail or exacerbate the problem; that funds leak to corrupt operators; that owner-built housing is shoddy and incremental construction inefficient; that NGOs can co-opt the interests of slum-dwellers to their own; and that self-help programs divert slum-dwellers from political struggle.

This is a long list and all of these arguments have a degree of truth, but they do not add up to a convincing case against incremental upgrading. Informal construction is less efficient in some ways, but has flexibilities that balance diseconomies of scale. One estimate in India is that formal housing costs about three times the price of informal upgrading per square meter. Corruption is of less consequence in informal construction because flows of cash are a small proportion of those in a formal construction process. Construction standards are often initially shoddy, but in many settlements the majority of buildings can be effectively upgraded *in situ* rather than replaced. Informal settlement is always already a form of social and political insurgency; incremental upgrading occurs in alliance with macro-political change.

To harness the productivity of informality to the upgrading process is not to suggest that slums are to be preserved; rather it is to make a distinction between slums and informality. A slum is a symptom of poverty; informality is a practice through which residents manage the conditions of poverty. There are limits to the role of urban planning and design in this context. Upgraded housing alone cannot stop overcrowding any more than architecture can stop poverty. Many slum families rent out space for purposes they deem to have priority over the relief from crowding – their children's education is often primary.

There are important exceptions to the case for incremental change. Some settlements are constructed to such low standards and at such densities that they cannot be upgraded without wholesale demolition. Many are on land that needs key infrastructure to be rendered safe, accessible or livable. Some have emerged in locations where it makes no sense to upgrade *in situ* because threats from flood or unstable land cannot be mitigated. Others are located so close to railway lines that either the railway or the housing must be relocated. Such decisions, however, are highly political as well as technical, and there is a key need for innovative solutions that do not involve surrender to the narrow logic of displacement to the urban fringes. What is needed are forms of creative spatial thinking that link an understanding of incremental change and existing morphologies to a larger-scale strategy of transformational change.

ASSEMBLAGE THINKING

Assemblage theory is substantially based on the book *A Thousand Plateaus* (Deleuze and Guattari, 1987) as developed particularly by DeLanda (2006, 2011). The term 'assemblage' here is a translation of the French '*agencement*' which is akin to a 'layout', 'arrangement' or 'alignment' – it suggests at once a dynamic process and a certain spatiality. An assemblage is a whole that emerges from the interconnectivity and flows between constituent parts – wherein the identities and functions of both parts and wholes emerge from the flows between them. Assemblage is at once both material and representational and defies any reduction to essence, to textual analysis or to materiality. So a street, neighborhood or city is not a thing or a collection of things – it is the assembled connections between them that are crucial: the relations of buildings to sidewalk to roadway; the flows of traffic, images, people and goods; the interconnections of public to private space, and of the street to the city. An assemblage is also dynamic – trees and people grow and die, buildings are constructed and demolished. It is the flows of life, traffic, goods and money that give the street its intensity and its sense of place. From this view all cities and parts of cities are assemblages. Assemblage is a useful way of re-thinking theories of 'place' and practices of 'placemaking' (Dovey, 2010: Ch. 2). McFarlane (2011a) suggests that the city can be usefully seen as a learning assemblage.

A key dimension of assemblage thinking is an axis of territorialization/deterritorialization that describes the ways social and spatial boundaries are inscribed and erased, the ways identities are formed, expressed and transformed. Territorialization is a synthetic process wherein wholes form from parts, identities from differences. Territories are 'striated' spaces in contrast to the instabilities of 'smooth' space. The focus, however, is on the process of territorialization (invasions of urban interstices, construction of houses, inscription of boundaries). Deterritorialization is the movement by which territories are eroded (squatter settlements are demolished). Deterritorialized elements are then recombined into new assemblages through a process of reterritorialization.

Assemblage theory is a useful framework for understanding the relationship of formal to informal practices in the city because a range of twofold concepts that resonate with informality/formality are deployed in *A Thousand Plateaus* as a means of understanding assemblages – rhizome/tree, smooth/striated, supple/rigid, network/hierarchy, minor/major. Informal practices are rhizomic in contrast with the tree-like strictures of urban regulation and planning; they involve minor adaptations and tactics in contrast to the major strategies of master planning; they involve informal network connectivity in contrast to hierarchical control. These twofold pairs form a large part of the conceptual toolkit in the work of Deleuze and Guattari (1987), pairs of binary concepts defined in terms of each other where the focus is on the dynamism between them. They cannot be seen as separate nor as dialectic relations but rather as overlapping and resonating together in assemblages. Assemblage theory is a theory of socio-spatial change, a theory of societies that is also a theory of cities. Importantly for the task of understanding urban informality, it incorporates informality as fundamental to understanding the productivity of cities and turns away from any notion of informality as an aberration or problem that can or should be erased.

Assemblage theory is essentially a form of philosophy, it involves a huge amount of jargon and requires a good knowledge of philosophy and social theory in order to even understand it. To apply such a conceptual framework to urban research is a further task. With this in mind (and at the risk of multiplying this complexity) I want to suggest that assemblage theory can be usefully linked to the cluster of theories on complex adaptive systems and resilience.

COMPLEX ADAPTIVE SYSTEMS

Theories of complex adaptive systems are more widely known and used, but with few exceptions rarely applied to informal settlements or linked to assemblage theory (Baser and Morgan, 2008; DeLanda, 2011; Rihani, 2002). This is work that grows out of a mix of theories of cybernetics, chaos, complexity and resilience (Gunderson and Holling, 2002; Walker and Salt, 2006). A primary linkage between assemblage and complex adaptive systems is the work of Bateson (2000), who was both a major figure in early cybernetics and a key source for assemblage theory. Complex adaptive systems theory is an attempt to understand the dynamics of complex systems where detailed outcomes cannot be determined in advance but rather 'emerge' from practices of adaptation and self-organization. The unpredictability is in part a result of the fact that minor changes in one part or level of the system can have pervasive effects throughout the system; and major plans for wholesale transformation can be stymied by deep-seated resilience.

The 'resilience' of a complex adaptive system is defined as its capacity to adapt to change without slipping into a new 'regime' or 'identity' (Walker and Salt, 2006). Resilience in this sense is not a static quality but a dynamic capacity to move between a range of adaptive states without crossing a threshold of no return. Yet beyond such a threshold change can escalate until the system settles into a new regime. Informal settlements often settle into forms of resilient yet dynamic stability. The phrase 'informal settlement' might more aptly be described as a negotiated settlement between informal and formal forces.

Resilience theory offers a way of understanding how such processes might be managed with a focus on certain 'key slow variables' that have potential to push the system across a threshold into a new regime or identity. Such variables may include land and rental value, economic vitality, gentrification, tourism, traffic speed and volume, building height and density, social mix and crime. As any of these variables changes incrementally, other parts of the system adapt. As land rent increases so does the pressure to displace informal urban practices. As residents are displaced they emerge elsewhere. De Soto (2000) has argued for converting squatters directly into land-owners by the granting of individual land titles; however, this often becomes a form of coercive displacement akin to gentrification, as former squatters sell their titles and become squatters again (Durand-Lasserve and Royston, 2006); there is no quick fix to tenure issues (Gilbert, 2009).

The characteristics of a system that can increase its resilience to regime change are mostly linked to diversity and redundancy. The diversity of the system involves a diversity of possible adaptations to change. Redundancy is the capacity of the system to perform in many different ways – to adapt to change by moving forms, functions and flows around, so different parts can perform a multiplicity of functions. The tendency to strive for optimum efficiency of the system – often the goal of formal planning – can reduce resilience because it leads to a loss of redundancy.

Complex-adaptive systems are conceived as enmeshed in cycles of change at multiple scales with four main phases of growth, conservation, release and re-organization. This cycle draws from the economic theory of creative destruction originally derived from Schumpeter and particularly influential in Marxist geography (Harvey, 1982) – capital produces cycles of creative innovation that destroy existing territories in order to create new ones. 'Growth' involves a major phase of development – the initial informal invasion of unused interstitial urban land may be a good example. The 'conservation' phase comes when these gains are significant enough to be conserved and protected: more permanent buildings are constructed, political liaisons established for protection, infrastructure is upgraded and the system becomes more or less resilient to change. This is a formalization process that can lead to stagnancy and loss of adaptability. The 'release' phase (if it comes) is that brief period when the forces for change overwhelm the place and it crosses a threshold and slips into a new regime. In the case of the informal settlement this may be when the settlement is demolished and residents are displaced. Re-organization is a creative period when a new order begins to appear. This may be the formal city that replaces the informal, or it may be the way the residents are either re-housed or re-house themselves. The settlement may also spiral downwards and stabilize as a dangerous and resilient slum; or it may be incrementally upgraded towards a more formal neighborhood.

These cycles of change are enmeshed in multi-scalar hierarchies called 'panarchies' where every system becomes part of systems at higher scales (Gunderson and Holling, 2002). These are hierarchies of scale rather than control since all systems are mutually interactive. Fast incremental changes at lower levels can force adaptation and re-organization at higher levels. In informal settlements this is the scale of room-by-room accretions and their social and access networks. At a larger scale we find the broader patterns of street and traffic networks and the interface between the formal and informal city. The resilience of the system and its emergent properties can only be understood through a multi-scalar approach. Systems can adapt to change by initiating or preventing change at lower and higher levels of the system. Demolition programs may be initiated at the level of the state; resistance may include sitting in front of a bulldozer, lobbying state politicians or organizing a transnational response through websites.

I have argued elsewhere that the frameworks of complex adaptive systems and assemblage can be usefully combined into the concept of a complex adaptive assemblage (Dovey, 2012). Assemblage is a multi-scalar phenomenon that can be understood at the level of the building, street, neighborhood, district and city. It shares with complex adaptive systems theory the desire to understand such multi-scale relations without reducing

the micro-scale to epiphenomena of larger-scale processes and structures. Both frameworks oppose any privileging of change from above and focus on understanding the relations and dynamics between scales, particularly the ways that many small-scale adaptations can produce synergistic emergent effects at higher levels. While the higher levels of assemblage may be identified with the state and institutions of governance, they cannot be seen as separate assemblages. While an informal settlement can be identified and territorialized as a discrete assemblage (as a noun), it is assembled (as a verb) through its multi-scale connections with the political economy of city, nation and globe. Such multi-scalar thinking is inherently interdisciplinary and requires that we think across the fields of geography, urban planning, urban design, landscape and architecture, overturning any hegemony between fields.

INCREMENTAL UPGRADING

The professional challenge of informal settlements is to engage with the complexities of incremental urbanism and informal process. The shaping of built forms and policies that are central to the built environment professionals in all cities remain central to this engagement. This is also a particularly interdisciplinary challenge. For geographers and planners whose focus is the larger scale, there is a need to incorporate the micro-spatialities and materialities of built form. For architects and urban designers, it requires a move onwards from both the fixity of form and the fixation on formal outcomes that dominates design professions. It involves understanding the dynamics of formal change in a context where formal outcomes are uncertain and where makeshift forms play important roles.

Our understanding of the urban morphology of informality is relatively undeveloped and often misunderstood. To understand how

they can be transformed, incrementally or wholesale, we need to understand how informal settlements work – the morphogenesis of how they emerge and grow as well as how they are inhabited and used. Since this will differ from place to place, engagement calls for forms of practice where research takes a much more integral role in the design and planning process, incorporating morphological and diagnostic mapping and modeling. Informal settlements are generally quite literally off the map of the formal city; community-based mapping has become a key task in building the knowledge base for incremental change (Patel et al., 2012).

There is a significant history of experimentation by those who have tried to harness the productive energies of informal urbanism to the upgrading process that I will briefly introduce here. The work of Turner (1976) and others was influential in the design of 'site + services' schemes as a basis for self-help incremental housing. This involves an acceptance of informal construction as the primary mode of housing production but seeks to locate such a process within a formal framework of serviced sites where public open space, access networks and facilities are formally designed and enforced. A variation known as 'core plus' involves the formal construction of a core dwelling that is designed for informal additions. Both such approaches have shown some success but require cheap land and have been largely limited to urban fringe locations. The 'open building' or 'supports' system is a potentially higher density version developed by Habraken (1972), involving three-dimensional serviced frameworks that require resident infill.

Each of these approaches involves a production of new housing on a cleared site where the urban design is essentially formal. Incremental upgrading by contrast largely retains the existing street and laneway network. One approach here involves diagnostic mapping that leads to some dwellings being replaced while others are renovated or informally upgraded. This involves a

Figure 30.4   Public escalators, Medellin, 2011

kind of double-logic where both formal and informal codes co-exist within the same settlement. Another approach involves the insertion of new public facilities, open spaces and public transport into an existing informal morphology. The best examples have emerged in Latin American cities such as Medellin (as shown in Figure 30.4), Rio de Janeiro and Caracas where libraries, gymnasia, open space, public escalators and cable metro systems have been inserted into the informal networks (Brillembourg and Klumpner, 2010; Gouverneur, 2015; McGuirk, 2014). Since informal morphologies are often both dense and crowded, it is a formidable challenge to undertake such approaches without displacement. Internal crowding means there is a need to increase building density, which is rarely possible without demolition and replacement. There is a need for the innovation of a range of spatial types at different densities that enable high levels of internal adaptation, subletting and spatial trading – enabling houses and enterprises to expand and contract with changing circumstances.

Most informal settlements have a relatively consistent typology of room-by-room increments, based on limitations of access for long span materials. There is also an urban design typology of laneway networks that are relatively permeable at the local level, but impermeable from the outside. This is a typology and morphology that works in many ways but is often dysfunctional in other ways – an environment starved of ventilation, sanitation, privacy, community facilities and open space with poor interconnections with the larger city.

One important conceptual shift is to move beyond binary thinking and to understand that 'informal' settlements are only relatively informal. What one really encounters is a double condition that is both formal and informal at the same time. This is not a hybrid, but a doubled or split condition; the prospect is to move from object-oriented formalist thinking towards new understandings of complex 'between' conditions of formal/informal and order/disorder.

Informal settlements are not chaotic, but embody an emergent informal order or code

of the kind that all cities need in order to work (Marshall, 2009). Informality is not unregulated, rather it is informally regulated (Arefi, 2011; Roy, 2009a). Under conditions of poverty, however, such informal codes are often insufficient and we see the result of a nasty version of the 'tragedy of the commons' where incremental encroachment starves the public realm of space, light and air. The challenge is to develop such existing codes into a more formal code where the escalation of encroachment on the public realm is contained or reversed. Any newly formalized codes that emerge need to sustain the productivity, amenity and sociality that is already embodied in the place, and acknowledge the dilemma that formalization inevitably eradicates some of the scope for informal adaptation.

Effective engagement with urban informality requires a renunciation of any fixation on formal outcomes. However, this also needs to be tempered by a critical engagement with the role of built form and place identity in practices of power. Informal settlements have negative symbolic capital; they are seen from the perspective of the formal city as a form of blight to be erased if possible. The negative place identity of informal settlements can inhibit social mobility through the enduring stigma of class distinction (Perlman, 2010: 10). A key task of the upgrading process is to incrementally erode distinctions of status that announce informal settlements as slums within the conceptual field or cognitive map of the metropolis. Such an image of place identity is often based in ignorance – informal settlements are generally enclaves that are hidden or seen only through the car windows or looking down from high-rise buildings. The insularity of informal settlements and the fact that they are outside state control often makes them a safe place for criminal organizations to take root – hidden from the gaze of the state and camouflaged by the informality. A key challenge lies in designing interconnections between the formal and informal city, ensuring better access to the city for

residents but also greater integration of informal settlements into the city. The lack of social mix within such settlements locks in a form of insular place identity that perpetuates poverty. This is a profound challenge because the insularity of such communities is often also a form of resilience – the adage that upgrading must be community-based, done with rather than to the residents, is surely correct but not easy. Jacobs (1961) suggests the term 'unslumming' to evoke a community-based process that draws upon the creativity and initiative of its residents, creating a desirable neighborhood where the most successful residents do not leave.

The challenge of incremental upgrading requires a critical engagement with issues of power – both practices of empowerment at the community scale and regimes of class-based disempowerment at larger scales. An effectively upgraded informal settlement can become an attractive place to live and work, not through a formal camouflage, but by celebrating and developing the diversity and dynamism for which the seeds are already present in the existing morphology. These are the same attractions that characterize the best of mixed-use, socially and formally diverse inner-city neighborhoods of rich cities – many of them former 'slums' that are now identified as creative clusters. Approaches to upgrading that address the problem of image can be superficial. Projects involving street art and house painting can work well when done in collaboration with residents, but can also be seen as a superficial form of 'makeup' or place branding.

DISCUSSION

How are we to meet the challenge of integrating informal settlements into the formal city? Will the mistakes of the past be repeated in the form of housing estates with populations socially and symbolically segregated into ghettos that reproduce poverty? What are the

possibilities for incremental redevelopment of existing informal settlements as formally, socially and functionally mixed districts of a more spatially just city? The crucial issue in practice is one of integrating social, spatial, economic and aesthetic issues within an expanded urban design and planning framework, and there are many good examples of this emerging (Brillembourg and Klumpner, 2010; McGuirk, 2014; Pieterse, 2011). Yet the many small success stories remain as somewhat isolated pockets that are not easily scaled-up – and the pressure from the state and funding agencies is to deliver results from the top-down, to turn community-based process into a technique that can then be deployed in multiple locations. There are many community-based techniques of organization, decision-making, mapping, design and construction that can be usefully propagated but these are also necessarily forms of agency and empowerment. To scale them up is to encroach upon existing power structures, whether political, bureaucratic or commercial. In many cases the barriers to scaling-up lie in a deep-seated resilience to change in the larger assemblages of bureaucracy and politics.

I want to return to the two key distinctions introduced earlier: between slums and informality on the one hand, and between squatting and informality on the other. Poverty is a condition of scarcity and of suffering, while informality is a resource, often the means by which poverty is managed. The distinction between squatting and informality involves an understanding that informality is not necessarily illegal, or at least has an ambiguous legal status. Most informal settlers own their house and have some rights over the land on which it sits – this is indeed their major capital asset and informality is the mode of production. As a capacity to act outside the control of the state; informality is a form of power. The challenge of upgrading is to reduce the poverty without disempowering residents. All too often upgrading preserves the poverty

while stripping residents of their assets, jobs and capacities for adaptation.

The power embodied in urban informality is a bargaining chip in any negotiation with the state. Informal settlements are the status quo; they are 'settled' by definition. The task of upgrading is to negotiate a better form of settlement, and any offer needs to be genuinely better than the status quo if it is to achieve real support. This is not to suggest too much optimism, since the status quo is also a form of production that has been largely produced by global capitalism. As Roy (2009a: 826) puts it: 'informality is not a pre-capitalist relic or an icon of "backward" economies. Rather it is a capitalist mode of production par excellence', informality is a form of deregulated market. This does not mean, however, that the problem might be reduced to one of global geo-political forces. Assemblage thinking does not remove the imperative for change at any level but it does remove the hierarchy between levels and suggests that the benefits trickle both up and down.

There is nothing essentially good or bad about urban informality; the crucial research questions lie in the myriad ways in which the formal and informal intersect. Much crime, violence and corruption is informal and the informal sector can operate in synergy with state and market oppression (Roy, 2009a). The informal economy can drain the tax base necessary for effective regime change at a higher level. Viewed from a macro scale, the informal sector can be seen as a black economy that denies people the formal living conditions and labor rights that have been won over centuries of struggle. Yet seen from the micro scale, these are conditions that have yet to be won. The desire for access to jobs, better housing, education and a life freed from poverty is a driving force of informal urbanism that is also a form of insurgency.

While upgrading clearly involves formalization, it also involves informalization. Some NGOs operate in a twofold manner across the formal/informal divide within and across

both formal and informal sectors – the informal sector formalizes and the formal sector adapts to the realities of informality (Roy, 2009b). We need policy that is flexible and adaptive, that both mirrors and accommodates processes of informality. While there are dangers that flexibility in urban governance can be a cover for corruption and runaway deregulation, it is surely clear that older models of comprehensive master planning will fail. It is also the case that models of urban design and architecture that are fixated on formal outcomes will fail. This is the great challenge for the professions: how to accept higher levels of unpredictability and informality without surrender to the ravages of neoliberal ideology? How to plan for the eradication of poverty in a manner that does not kill the vitality, productivity and adaptability that sustains lives? How to formalize the informal city without erasing the complexity and adaptability that produced it?

So finally, what is the point of assemblage theory? What does it add to our understanding of informal settlements and incremental upgrading practices? Why do such practices, which are happening anyway, need any theory and why assemblage theory? Theory is not the end but a primary means of rethinking the informal city, the point is not to make a theoretical point but to change the world. Assemblage is a mode of thought more than an explanation of the world; it is a conceptual toolkit that is not evident in its products, any more than we can see the shovel or the hammer in the hole or the house. Theory is a means of understanding the city as a basis for change, yet understanding and changing the city are always integrated in practice. The last fifty years of attempts to deal with informal settlements through demolition and formal resettlement have been based on an inadequate conceptual toolkit.

Assemblage is variously termed assemblage thinking and assemblage theory, which reflects the fact that it is at once both a means of engagement with the world and a more formal theoretical discourse.

A fundamental way in which assemblage thinking contributes to a critical understanding of the city lies in a reconception of power. The Deleuzian conception of power relies in large part on Foucault's work on power as distributed micro practices that are insinuated within fields of operation rather than simply being held by agents. For Deleuze this goes well beyond the production of the disciplined subject to link power to flows of desire and processes of becoming. In assemblage thinking power is immanent to the assemblage, it operates and mutates through the connections between sociality and spatiality, between people and buildings. As Hardt and Negri (2000: 24) put it, 'what is directly at stake in power is the production and reproduction of life itself'. Assemblage thinking engages with power as productive capacity and empowerment (power *to*) as much as relationship or oppression (power *over*) (Dovey, 2008: Ch. 1). There are attempts to co-opt and contain assemblage thinking within the paradigm of urban political economy (Brenner et al., 2011) and while this is a productive dialogue I suggest that it also continues the hegemonies of scale and reductionism critiqued earlier in the work of Davis (2006). To characterize urban informality as merely a 'self-help' response to the failures of the state is to remain locked into utopian thinking, working and waiting for a revolution. Assemblage thinking offers a broader ontology of power. All of the approaches that are working in the redevelopment of informal settlements involve the integration of a range of levels of power from micro-scale adaptation to global practices; both new forms of empowerment and new forms of control, both global and local change.

McFarlane (2011a) argues that assemblage thinking extends the project of critical urbanism through new methods and scales of empirical research; enabling us to understand how agency is embodied in built form and reinvigorating the urban imaginary. Assemblage requires attention to the micro-spatialities and materialities of the city; it

may seem a fetish to those focused on political economy. It enables us to rethink the role of built form in mediating social change without the accusation of environmental determinism. Assemblage thinking is multiple; undermining any reduction to singular ways of thinking – economic, social, political or formal – rather it connects them. Such an approach is integrative; forging interconnections between the sciences and humanities, between spatial analyses and discourse analyses, between research and design. It brings productive rhizomic and informal practices to the forefront of professional thinking. It is a useful framework for understanding how informal urbanism works and intersects with the formal city. It can help to turn around the dominant paradigms and ideologies of the built environment professions that are essentially top-down and formal by nature; architects and planners are trained to design and implement formal plans. Assemblage thinking involves understanding the morphogenetic processes through which built form emerges.

Assemblage thinking is socio-spatial and diagrammatic; it helps in understanding the ways that cities are produced by the intersections, interactions and synergies between flows and forces – social, spatial, economic and symbolic. It forges new and complex interrelations between professional practices of mapping, diagramming, planning and designing. Assemblage thinking is multiscalar, cutting across hierarchies and hegemonies of scale and valorizing the small scale and a flat ontology. The division or construction of a room can be more important than a housing policy when it is multiplied by a million adaptations. Assemblage is border thinking with a focus on between conditions, the erasure of boundaries and blurring of identities. One of the key tasks for informal settlement upgrading is to erase the class distinctions between formal and informal, and to stop the reproduction of poverty embodied in much social housing where informal practices are paralyzed and negative place identities are produced.

Assemblage embodies an ontology of becoming, replacing Heideggerian notions of 'being in the world' with the more Deleuzian 'becoming-in-the-world'. It leads us to think of the city beyond its existing properties to encompass its capacities – the city as a space of possibility (DeLanda, 2011); the informal settlement as a learning assemblage (McFarlane, 2011b). Turner (1972) long ago proclaimed 'housing as a verb', a potent concept that needs to be enlarged to embrace 'settlement as a verb'. Informal settlements are not simply objects to be studied and upgraded, but practices to be understood and enabled as they are formalized. In the end there is no single point to assemblage thinking; it is instead a tangle of lines of thought, an invitation to enter into the difficulty of the multiplicity. Informal settlements are complex adaptive assemblages that we have scarcely begun to understand.

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