... the diffuse placelessness we experience today is a consequence of the loss not of the simple geographical locatedness of place, but rather of the loss of a network place-generating *effect* which was a characteristic product of a 19th century urbanization pattern. ... [I]t is not, as is often assumed, a question of there being two categories; of the dynamic on the one hand and the static on the other; ... (or of 'spaces of flows' and 'spaces of places'). Rather it is one of the successive *grounding* of the effects of scaled movement and connective networks in other networks and the construction thereby – through an increasingly thick layering of networks and their effects onto one another, down to the most local – of local place.

The Urban Machine

Gerhard Bruyns and Stephen Read

A crisis of our thinking

> The world of supermodernity does not exactly match the one in which we believe we live, for we live in a world that we have not yet learned to look at. We have to relearn to think about space.
> Marc Augé[1]

> The first rule of method:
> We will enter facts and machines while they are in the making; we will carry with us no preconceptions of what constitutes knowledge; we will watch the closure of the black boxes and be careful to distinguish between two contradictory explanations of this closure, one uttered when it is finished, the other while it is being attempted. This will constitute our first rule of method and will make our voyage possible.
> Bruno Latour[2]

This paper attempts to construct a different primary 'fact' about the city, and to replace an old one: it attempts to show how 'city' or 'urban center' or 'urban site' in general may be *not* an entity identified by being 'not-countryside' or 'not-periphery', but rather an everywhere *local effect* emergent within an ultimately *global* extension of sorted and stratified movement and communication.

There have been a number of developments in science and philosophy over the past hundred years or so that have made us think again about the self-evidence of a frame through which we look at the world around us.[3] All is not as it seems, we have discovered and been told; the world as it is resolved within a set of presuppositions we have inherited from the 17th and 18th centuries, may be not the unproblematic, self-evident and singular objective reality we take it for. It is perhaps not surprising that, in spite of knowing that all may not be quite as it seems, we go on with our everyday lives as if all is indeed exactly as it seems. We don't feel the need to question the everyday appearances of this world before us at every turn, if what appears before us serves us in our dealings with it and with each other. The trouble starts when we extend this practical acceptance of the world as it seems beyond the point where common-sense presuppositions and approximations are capable of resolving the things we are looking at. We live in a world which is changing, and some of the propositional approximations we take for granted and have absorbed into the background framework of our common knowledge and culture, are showing their age. It is in the nature of these things, that we resist changes to these approximations; in their totality they form a dense highly interlinked and interdependent web of 'facts' and rules of thumb that constitute our 'grip' on the world and our place in it, and on what we like to think of as a singular objective reality. We tend instead to hold fast to these approximations and ascribe multiplying anomalies to processes of disorder, to chaos and to degeneration. Things seem never what they used to – or aught to – be. 'Objective' reality, insofar as

we can talk about such a thing, is probably largely immune to our own formulations of order or disorder – these are states we impose on material relations, fluxes, intensities and forces, through our understanding, or misunderstanding, of them.

When it comes to matters of our built environment, the evident concreteness and apparent stability of our surroundings blinds us to its complex nature as effect and as *environment* – as a world that is not only the only world we are immersed in and can know, *but also the very condition for that knowing*. We continue seeing urban space as a neutral availability; we see the form of our city as a process and a construction only in the sense that we build the thing. We have constructed an urban practice which sees urban elements as fixed things, and which sees the city itself as a fixed and finished and self-evident thing and as something apart from us.

But at the same time some rather puzzling and anomalous factors have begun to affect our everyday urban lives, profoundly changing their existential and social characters and qualities. Many urban and cultural commentators link these changes to spatial matters; a well-known thesis tells us that the world is speeding up and our social relations are becoming more attenuated. The built environment is in the process being divided up into enclaves, archipelagos and capsules of controlled, regulated space, in a wider sea of disorder and chaos. The capsules and enclaves are understood as the moments of repose, safety and order in an otherwise disorienting whirl of movement and disintegration.[4] The position we will propose though, is that the disorder we face is in the first place a failure of our *understanding* of the urban world, and that the strategies we use to control 'chaos' may be misplaced if that 'chaos' is a factor of our presuppositions rather than one we can simply ascribe to the objective world.

The perhaps rather counter-intuitive idea that we will begin to outline here is that urban space and the sense of a located place has *always* been a matter of movement, that it is possible to propose an alternative urban spatial order *founded* in movement, and that the reassuring solidity and stability of the place experience is not a primary given, but rather in the first place, an *effect* of movement. It is proposed here that the root of our confusion is our stubborn holding to an idea of the city as object. It is our equally stubborn holding onto an urban space as being some kind of objective reality existing prior to our construction of it. If one conceives the city in terms of things held in a plan-like extension, it becomes self-evident that the development of the city is also a matter of self-evident things and their composition into a plan-form. We too easily act, or attempt to act, like generals and admirals moving troops and ships over a board under overhead lights. Space in such a conception can never be anything other than a neutral surface on which the master-planner shuffles the forces at his disposal. An active space would have to deal with effects rather than things – it would have to see the shapes, characters and orders of the city as an emergent consequence of *dynamically* and 'internally' relational spatial matters.

We have constructed an urbanism in a time of accelerating change that has difficulties understanding its object as a process, and has difficulties dealing with the nature of the city as a dynamic interrelationality. Our urban thinking today is focused on stability and equilibrium and its loss, and our urbanistic strategies have become focused on control and on the securing and defense of places. When we think of flows, we think about securing its products to place, and have difficulties understanding that in a circulation the products of flow *are* place.

What is essential today, we believe, is that in our urbanism we get beyond our naive common-place presuppositions about environmental space in order to develop a spatial view of the city which is functional and operational in the sense that it allows us to theorize and reflect effectively on urban form and change and our responses to it. What is essential today is that we develop a conception of a dynamic urban space of self-formation and transformation (to go alongside the obvious political, administrative and management views founded in a conception of social justice) as a grounding for a practical urbanism; one which is capable of linking the past of the material city with its present, and one which is capable of theorizing and understanding spatial and material tendency and transformation we are experiencing in our cities today.

The emergence of things

Instead of seeing the world as a thing separate from ourselves – and as a closed clockwork universe whose objective truths we might unproblematically and systematically reveal through the procedures of science – we could think of it instead as being in itself radically open, and that it is we ourselves who close it, always provisionally and approximately, through the way we make sense of it with our concepts and propositions.[5] Instead of accounting for shortfalls in the order we detect in the world through an appeal to chaos and degeneration, we could seek instead to build new propositions which account for it better.

We have lost sight, as Gregory Bateson has pointed out to us, of the role of mind in the articulation of our material and objective world.[6] The world as it appears is not simply an independently objective thing – nor are the constituents of the world as they appear singularly and objectively differentiated things. The great advances of thinking in the physical sciences around the turn of the 20th century, and the recognition of the role of language in the construction of our knowledge of the world, have called into question the status of both the subject *and* the object. The world in itself, before our creative shaping of it, is a flux of pure material, of vectors and forces; an as yet unknown arrangement of movements and intensities. We imaginatively make sense of this world, actively perceive and construct 'differences' within it and impose on it our own meanings and values. As part of our process of language (perhaps also of pre-linguistic knowing), we construct distinctions, formalize a system of preferred or significant relations and articulations, and thereby construct a space. The world of *named* and known objects and events is a construction of our individual and collective creative imaginations and is framed in a space which is itself the form of that construction.[7]

We can think of two spheres of explanation in this way of seeing things – one consisting of a world 'in itself' so to speak, (which is perfectly capable by the way of its own problematisation),[8] and one of our own construction of this world. These two spheres need, in order to be useful to us, to have some kind of relations (however sketchy, partial and provisional) with each other. We could speak of isomorphisms,[9] but if we do then we would need to be clear that we speak of *dynamic* isomorphisms and of a '*vector*' of knowledge which in the process of its formation tracks a form (which is itself a process of becoming) in the world. Bateson uses Gnostic terms to distinguish between the two worlds of explanation. What he calls the *pleroma* is that world in which events are caused by material forces and impacts. It knows nothing of essences, ideal forms and categorical distinctions, and contains in itself no ideas.[10] It is a world in which there are no *a priori* thing-like distinctions. The *creatura* on the other hand is what he refers to as "the world seen as mind" – it is that world articulated by the distinctions which we draw over, and attribute to, the *pleroma*.

It is out of the *pleroma* – out of that field of forces and impacts ordered within its own space – that concentrations, intensities and dispersions arise which offer themselves for differentiation and closure. Out of the openness of the world – which is not in itself formless, but is certainly prior to our boundings and articulations – we construct differences, closures and meanings. We establish dynamically, on the go so to speak and by a process of focusing on and tracking movements in the world, relations of correspondence between nameless concentrations and intensities delivered by the *pleroma* and the nameable distinctions or closures in the *creatura*.

It is not so much that the forms of the *pleroma* are indistinct or 'soft', more that the *pleroma* for the most part will tend to be formed by and within a different space – and need to be outlined in a space of our focus and involvement, of our living or thinking or our encounter with the event, in order to become recognizable. At the level of the *pleroma*, the form of a soap-bubble for example emerges out of a state space of free energy differentials which is indifferent to the coordinates of an everyday three-dimensional Cartesian space in which its spherical form is described. This state space is the active space of the bubble's formation, and is radically different to the in general passive space within which we categorize regular and irregular forms. The 'shape' of the *pleroma* has been visualized by Waddington as his so-called 'epigenetic landscape' to explain biological morphogenesis.[11] De Landa uses the mathematics and visualization techniques of Poincaré. The point is that the two spaces are different – the *pleroma* lacking the outlined nameable and categorizable forms of the *creatura*, offering in its place a distributed and variegated field of active relations whose force and energy states can be represented in a space of minima and maxima, and gradients and stability points acting as attractors, which guide processes of formation, rather than being descriptions or categorizations of form.[12] The categorizations resulting from operations of bordering and the tracing of outlines are our own constructive moves and are part of the workings of the *creatura*.[13]

The so-called *emergence* of forms in the immediately perceptible world is therefore about the existence of a space which is other than, and prior to, the one we construct to describe the events we see around us which are the products of this other space. One could say perhaps therefore that the form and emergence problem consists in the seeking out, as Waddington and Poincaré attempted, of the *active* space of that form's becoming; in fact of attempting to establish a serviceable translation between the space of the behavior of phenomena in the world and the space of our approximate understanding and description of that behavior.

Our constructed worlds are practical and approximate closures of an open material world, rather than being mappings of an objective truth,[14] and the frameworks by which we understand our worlds (or rather the spaces which organize these constructed worlds) are constructions of particular historical and geographical moments; provisional 'truths' which have gained acceptance, been absorbed into a culture of knowledge, and proved interesting or useful at particular times and places. As Bruno Latour says: "Simply to 'be there' is not enough for matters of fact to be absorbed, associated, digested, rendered compatible with other conflicting claims: they have to be composed, they have to become instead states of affairs."[15]

These compositions, these 'states of affairs', are though not the only space we have to contend with, and this is where our 'crisis' mentioned at the beginning of this paper comes in; flows and collisions of matter and energy beyond our imaginative cultural constructions conspire to transform the conditions of our worlds behind our backs – or in front of our eyes for that matter – and to our great confusion if we hold onto all our 'truths' as being 'objective'. We individually and collectively

construct our worlds and space to be useful to us, but in projecting these constructions into the future (or even into other places) we can go very wrong indeed. The world has the power to surprise us; the *pleroma* has its own agenda which can escape our propositions about it. Projections into the future of our *creatura* constructions are liable to run up against different linearities or non-linearities in the space of the *pleroma*, The 'poverty of historicism' is about the gap between these two 'worlds of explanation'.

The first space of the city

The most important claim we want to make here is that our primary space of the city, one that we almost by default regard as self-evident and objective, is not objective at all in the sense of corresponding to a closed and 'natural' reality, but is rather a mental space, a space which is the product of our individual and collective creative imaginations. The fact of there being an apparently self-evident 'objective' city that we don't examine further because its objectivity is so obvious, is itself part of our crisis. The intention here is not to make a claim for mysticism or claim that we do not attempt at all to theorize the city as a generative multiplicity, rather it is to critically examine an underlying and taken for granted spatial framing through which we filter all our other ideas of the city, and the nature and the shape of the objective city we are dealing with, and then to offer a new one.

It seems to us that the first space through which we filter all our perceptions and understandings of the city is the one which divides the city from what we see as not-city. This first space is one that can be approximately summed up in the figure-ground of city-countryside, or center-periphery, or the idea that the city has an inside and an outside that is demarcated by objective, even if fuzzy, boundaries.[16] This spatial framing is implicated also in an assumption of place as being self-evident; pure location, given by geodesic coordinates, and delimited by edges or borders, fuzzy though they may be, that divide it from what is not that place. In fact the 'place' of the city we think in (what we will call the 'territorial view') has been problematic (as an explanatory concept anyway) in western cities for two centuries or more,[17] and has long been more connected to our construction of our *own* place, the identities and exclusions we associate with it, and claims we make on territory, than to any place out there in the world. The everyday understanding of the urban center is a product of an historical moment in the development of the field of urban vectors and forces. And we would say that it was clearly not, even then, the only possible construction from this particular configuration of forces, and their resulting concentrations and dispersions. We are, in this time of accumulating urban degeneration and loss (of place, coherence, identity etc.), in search of another space in which to frame the city – one which will account better for the city as it is ordered and organized today. Ideally we are in search of a space which will do this while it also accounts in retrospect for the city of the past. Then we will have a space which not only accounts for the functional order of today's city, but also accounts for the transformations we experience in the city today in relation to that city of the past.

So the first question regards the status of our first, most taken-for-granted assumptions about the space and place of the city. The center-periphery, or city-noncity spatial pattern as applied to the city is a construction, a distinction drawn by us. It has no *a priori* objectivity, and we will attempt to show that we can construct another more efficacious framing which will account for center-periphery *as effect*, rather than as primary reality – as well as potentially for a lot of other things that we at the moment account for as degeneration and disorder.

Our present *creatura*-space organizes the city on the basis of a separation between the 'inside' of the center and the 'outside' of the periphery. The walls of the fortified citadel have come to represent for

us the incontestability of the border as a condition of urban form. The stability of the city as a mental construct – as well as our current confusion at the breakdown of this stability – owe much to this image. As the city escapes its borders, and begins unequivocally to constitute our whole world rather than simply a point of intensity in it, what we seek now is a mental apparatus which frames the dynamic of the changes overtaking us. What we want in fact is a *creatura*-space that is capable of accounting for the whole urban world, *including its borders*, as a changing effect of a space which precedes borders.

This is not the first time this view of the city defined by its borders has been questioned. But, even as their porosity is acknowledged, it is still the border which delivers form.[18] Virilio goes beyond seeing the border as a passive containing element, rather understanding it as an active element shaping the substance of the city. This substance exists, he proposes, in a metastable state, as movement and traffic – the border becoming the device which controls and regulates this movement, defining in the process a privileged inside opposed to the danger of the outside. The border here has become active, but this view is still too closely related to many of our present notions of a city divided into 'ordered' and defensive capsules and archipelagos[19] immersed in a sea of chaotic, disorientating, even violent and uncontrollable movement.

The idea of movement itself being the constitutive substance of the city can be taken further to begin to define another active and formative space: "The town is the correlate of the road. The town exists only as a function of circulation, and of circuits; it is a remarkable point on the circuits that create it, and which it creates. It is defined by entries and exits; something must enter it and exit from it. It imposes a frequency. It effects a polarization of matter, inert, living or human; it causes the *phylum*, the flow, to pass through specific places, along horizontal lines. It is a phenomenon of *transconsistency*, a *network* …"[20] The urban object has in fact always been founded in its relations with the rest of the world, and grounded by the flows which pass through it.[21] It exists as a 'remarkable point' that is produced by circuits, even as it produces them. As an effect it emerges like the standing wave in a fast-flowing river, dependent on the flow to maintain its shape. As an object it settles out of flows as an efflorescence or concrescence, as a sediment laid down by network flows over time.

We have seen that the border is also a means by which we cut up the flux of *pleroma*-reality, dividing and ordering it into nameable chunks. It seems clear intuitively that the border sits more comfortably with the spatial operation of delimiting, characteristic of the *creatura*, than with the open gradients of the 'epigenetic landscapes' of the *pleroma*. There may also be borders which emerge out of the flux, but these are borders of a different sort; they are more likely to emerge as part of the collection of effects which pop out of the urban surface to surprise us rather than being the spatial operation that we impose on the city to bend it to our knowing and our will. Bordering as an operation has been turned in the real world to the purpose of naming and defending territory – outlining 'neighborhood' and 'our place' – but this is first and foremost an operation of the *creatura* which is imposed *onto* the world. It is an operation of control and of an imposition of fixity, an attempt to control the proliferation of the flux by cutting its vectors with mental outlines made material.

The act of bordering and enclosing in the real world has this character of making our mental constructions actual, of 'realizing abstractions'. It is part of what we as active and creative creatures do with the world, and may be necessary to make the world inhabitable – but it also cuts through lines of force, disintegrating integrating dynamics, deactivating active formative spaces, and replacing them with the passive spaces we use for the description of static forms.

Different spatialities deliver different organizational mechanics. But the network, just like the circumferential segmentation of the center-periphery space, is an abstraction. Networks have no immanent or *forceful* reality in themselves; they become forcefully real to the extent that they are performed. And performed they become pathways traversed by stuff already constituted and meaningful, and in durations and at speeds and frequencies, and not the abstract, instantaneous node and edge relations we often use to represent them. Even instantaneous, or virtually instantaneous, electronic networks deliver content and content implies work, duration, delay, a certain time, rhythm and friction, and an interdependency with other supportive or dependant performed networks which deliver content, and are subject in their turn to other rhythms, durations and frictions. There are in other words institutional rhythms and times which both constrain network dynamics, and perhaps more importantly tie these dynamics into coordinated relations of interdependency with other networks. In the same way, the routing of performed relationships are subject to the constraints of built opportunities for connection – infrastructure seen in its broadest terms. It is along these infrastructural links that the pathways are cut from far to near, from the general to the particular, from the global through to the local and back again. As Latour says: "There are continuous paths that lead from the local to the global, from the circumstantial to the universal, from the contingent to the necessary, only so long as the branch lines are paid for."[22] This is not the network of the well-known 'object-attractor and accessibility' model; rather than the nodes being substantial urban and architectural objects and the edges insubstantial relations of frictionless connection, urban network edges are themselves substantial vectors not only of displacement but also of emplacement. This is a spatial operation we know already – but more from our embodied, embedded experience of these things in context, than from the simplistic reductions of our disciplinary procedures.

The street, the lane, the boulevard and the highway become active as parts of extended and layered networks, and we see the formations which are their results in the centers and high-streets of established villages and towns, in the strips and ribbon developments along car routes, and in the edge-cities and corridors emerging on today's motorway networks.

A new first space of the city

In order to understand our contemporary city – and to understand cities of the past in a different and more interesting and practical way – we need to move away from the obvious, or the seemingly obvious, that has become increasingly a barrier to understanding. Instead of starting from a self-evident local place, conceptually divided from its surroundings, we need to move towards a simple spatial framework which allows the local to emerge out of continuous distributed fields of vectors, forces, intensities and concentrations, with integrating circuits of movement and connection which exist in a state of interdependency with other integrating circuits of movement and connection – and then try to imagine how this could always have been the case.

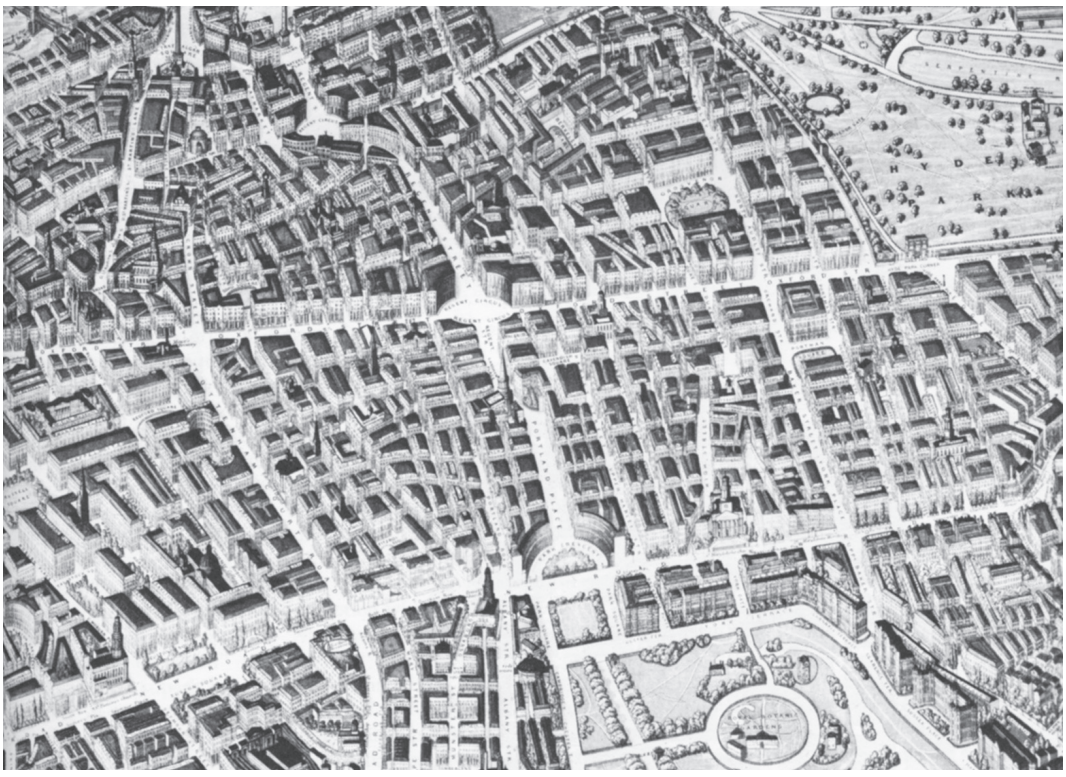
It is the medieval city which most often shapes our preconceptions of what the city is. With its solid materiality and its walls it captures in a concise image our presuppositions of the urban. But now, instead of using the historical, and specifically the medieval, city as the basis for grounding our view of what the city is and can and should be, we propose that we start from a position much closer to our contemporary urban. There could be no image which contrasts more forcefully with that of the medieval citadel as an image of the city, than that of the contemporary freeway network. It represents pure movement as opposed to solid stasis, a distributed intensity as opposed to a delimited bounded centrality. Yet it is here we will propose that we can find the basis of a simple

The metropolitan grid in the fabric of the contemporary city. This grid 'hits the ground' (of other slower, smaller-scaled grids) usually rather ineffectually, but never without any effect whatsoever.

spatial model on which can found an understanding of the city's formation – even when we are talking about the city at its origins.

It was Jane Jacobs, building speculatively on archaeological research on ancient settlements in Anatolia, who suggested that the first human settlements larger than the camps of hunter-gatherer bands were located at strategic nodes in long-distance trading networks.[23] It was traffic which supported their formation, and it was the movement network, on a sub-continental scale, which was the active space behind their formation. As urban creatures today we inhabit not so much cities as a continuous urbanization. This feels like a new condition to us, but from the first trading settlements Jacobs describes, through the medieval market town with its intimate interrelationships with its agricultural surroundings and with other market and trading towns, through the 18th and 19th century industrializing city, where many sites of industrial development were located in what have been characterized as rural areas, through 20th century cities and their commuter belts, rail and freeway networks and metropolitan regions, to the continuous city of the 21st century exopolis, it has always been a difficult exercise determining a border between what is city and what is not. In spite of this, centers have emerged as strong identifiable places and have had a certain stability and durability about them. What is it that supports this stability and durability in what is after all a movement?

If we are to conceive of the emergence of centralities as effects, we must first necessarily be able to think of an active 'pre-centered' plane or field out of which such centralities could emerge. Fortunately, the almost perfect image of such a thing – the counter-form to the medieval citadel – exists already, and it takes no great effort of abstract reasoning to think it; the freeway network



The emergence of the supergrid in the fabric of 19th Century London. These 'urban high-ways' of the 19th century are 'grounded' along their lengths by their immersion in a finer, slower, local grid.

spreads itself out now web-like and borderless over the whole geographical territory. We have a candidate for the primary 'pre-individuated' centrality – a diffuse intensity which distributes itself over the urbanizing landscape.

If this was all there was to it we would be justified in proposing a completely new diffuse or 'lite' or 'generic' urbanism, an urbanism of flows, fundamentally different to the urbanism of fixed places of the past. However a closer look at a city type of the recent past, the European industrial city of the 19th and early 20th centuries, shows something very interesting. What we see here is not an intensity of centrality graded homogeneously from centre to edge of a fabric, but rather a complex configuration of centers, spread out over and through another web-like network covering the everyday functional extent of the city as it then was.

Urban infrastructure development from the early 19th century was characterized by boulevard and avenue building, creating networks geared to the increasing size of the city and the increasing mobilities of its populations at that time. These primary movement networks constructed in European cities of the 19th century were the 'freeways' of the day, cut to the speeds and mobility ranges of their time, and these longer routes through the dense fabric of the European center reveal themselves as surprisingly coherent grids – we will call them 'supergrids'. It seems we are bound to build the city at a scale which reflects the prevailing scales of life and mobility of the time. Higher speed, and wider-spread networks also began to be built outside of the central urban fabric, and these were later to be superseded by the freeway network as it spread in the 20th century over what in the beginning still appeared to be countryside.

In the late 20th and early 21st century our primary city movement networks are being built at the scale of the metropolis and the mega-city region, because this is the scale and the range at which dominant movement takes place. In the 19th and early 20th centuries, at a time when the bulk of urban movement was captured within the bounds of the city as it was then known and understood, this scale was that of dominant relations of that time. This generalization does not capture the whole of the urban social and economic dynamic of course because relations between cities were as important then as they are now. What it does capture is a logic of urban form, which is a product it seems of *gross* movements of traffic; the city is shaped by the actual mobility dynamic and its bulk intensities, including all those countless anonymous everyday movements that make up the life of the city.

What we are dealing with here then is a *gross* material flow, rather than the movements invoked in the significant transactions studied by sociologists and economists. A flow considered as pure material that produces the urban scene as a dynamic effect – in the same way as the flowing water is a necessary material condition for the production of the standing wave. The next paper in this publication describes urban place as a product of an 'ordinary urban' space mechanics of the 19th century city. It describes also how the diffuse placelessness we experience today is a consequence of the loss not of the simple geographical locatedness of place, but rather of the loss of a network place-generating *effect* which was a characteristic product of a 19th century urbanization pattern.[24] As far as the construction of place is concerned therefore; it is not, as is often assumed, a question of there being two categories; of the dynamic on the one hand and the static on the other; of networks on the one hand and self-evident locations on the other (or of 'spaces of flows' and 'spaces of places'). Rather it is one of the successive *grounding* of the effects of scaled movement and connective networks in other networks and the construction thereby – through an increasingly thick layering of networks and their effects onto one another, down to the most local – of local place.

Urban place and its production has already gone through one change as the scale of urban mobility ballooned in the industrial era, and it is going through a more substantial change right now. The kind of centrality we experience in urban places, centrality *as effect*, is a consequence of the layering of diffuse (pre-individuated) intensities in active network infrastructures of different scales over each other. It is a consequence of the ways overlaid movement grids working at different scales cause their moving materials to interact with each other, bringing different speeds and divergent space-time frames – through the populations inhabiting them – into constructive and mutually interdependent interfaces with each other. These interfaces are part of the patternings of the webs of overlap and interdependency that produce the grounding and the solidity of our everyday social existence.[25]

Our problem today is not a loss of a primary place bound to the geodesic coordinates of location, it is a loss of this place-generating and everyday perceptual-solidity generating network effect in the infrastructures we build today.

Building today's city

Of course the city is not simply a process of emergence – we also build it with architectures and infrastructures. And we tend to build it in the shape of the spatial understandings we carry around with us; as realizations of our ideas about how the city is put together and works. We are to some extent capable of building our present-day 'city seen as mind' – a technocratically ordered distribution of objects and bounded areas linked by infrastructures of pure accessibility. We see the

results of this building all around us, most notably in capsular business and industrial parks, the nodal functional 'attractors' on the so-called 'periphery', and the flat, featureless residential areas, all connected by simple accessibility-providing off-ramps to the freeway network. We make the city in the shape of our ideas, and the city we are making today tends to be one of lifeless bounded areas and object-centralities linked in the most simplistic way possible to the metropolitan-scaled movement grid – and often entirely disconnected from anything else. We are building 'places' in other words tied to just one infrastructural network supporting just one speed and just one quality of space-time – simply eliminating the possibility for a place-constructive, and social solidity generating, mechanics delivered by interfaces between infrastructural networks supporting the other speeds and other space-time qualities we found in previous city forms.

In fact the infrastructure of electronic and personal communication networks does overlap and interface with other networks in the contemporary city – but apparently this interface does not carry with it the power to generate the kinds of places we expect to encounter in the city. There is a lot more that needs to be said about this, and space prohibits this here – but there are signs that changes in our expectations of what places should be, or what they should exhibit in terms of their place qualities, may mean that some of the potentials of this particular set of interfaces are still to be explored.[26]

What is proposed here though relates to a revealing, and an exploration, of the potentials given in the overlaps and interfaces between dynamic populations inhabiting movement and communications infrastructures, and the construction out of these interfaces of a dense, solid and locating sense of being 'in place'. What is proposed as a framework for thinking these potentials is a new primary city-space (*creatura*-space) consisting of infrastructural grids working at different 'speeds' and scales, all supporting their own distributed intensities – all supporting diffuse pre-individuated centralities spread evenly through their grids. These grids, scaled from the metropolitan-regional to the local street grid, may overlap with each other, bringing different movement circuits and speeds and space-time qualities into place-constructive interfaces with each other. Space-time frames and speeds are superimposed – become 'cogredient' in Whitehead's terms – and it is in this superimposition that the 'event' of the place effect is produced.[27] What is proposed therefore is a device, a diagram, or set of diagrams, which are not in themselves the center-object we seek but become rather a surface or an armature (itself material and mappable in the real world) on which centrality effects and place effects may emerge.

The urban machine

What is the status of this layered armature or device? It is not a distribution of simple objects or arrangement of bounded zones, the way centers and places appear in the center-periphery image. It is more a framework for locating the distribution of effects arising out of the superposition of objectively different space-times held in movement grids and produced in movement. It is a framework for very simply diagramming the effects of the superimposition of multiple layers of speeds of movement, multiple continuous and distributed space-times, out of which we may be able to picture the places we know from our experience of the city emerging. It is an emergence framework for the city, a diagrammatic frame for organizing vectors, forces, and their emergent effects. It is a framework for understanding the becoming of centering effects which we would otherwise only be able to see as the being of bounded thing-centers.

If we look to the example of the traditional high-street in a city like London or the boulevard in Paris: we understand it at present as a local intensity which we then immediately and rather

arbitrarily outline and turn into a thing. The high-street is actually an effect of the overlap of two differently scaled and 'speeded' distributed intensities; one carried by the local street grid and the other by the superimposed 'supergrid' of urban distributive routes (the boulevard network in Paris for example) characteristic of 19th century European centers – with metropolitan and global scaled effects thrown in where these are carried by their respective communications infrastructures into the central grid. The local movement circuits of the area around the high-street meet the movement circuits of the network at a scale and speed of movement higher. Our customary outlining of the high-street as thing, incorporates no deep reflection of the formational logic of that thing. In fact the problematic nature of this delimitation is here illustrated perfectly as the limits imposed by the outlining cut up the field which is the very condition of the high-street's becoming.

The important practical advantage of this spatial division of the city is that the analytical knife is wielded horizontally; there are no vertical slices which arbitrarily divide adjacencies from each other. Limits to the horizontal distribution of intensities are imposed by the limits of the respective infrastructures which carry them. At the same time the resolution and penetration of the 'space of flows' idea is improved through a sequential application of the same idea at ever finer grain. Material infrastructures and their effects are analyzed sequentially all the way down to the local, revealing in the process the conduits and the spatial interfaces through which the scales of the urban, the metropolitan and the global invade our local lives. It makes explicit the staging posts in the continuous pathways and the branch lines, the spatial switching-points and transmission stations, which lead us from the local through the urban to the metropolitan and global and conveys the global and metropolitan back to us again.

At the same time it provides a device for diagramming the layers of 'speeds' and movement intensities and their centrality effects in the surface of a complex fabric, rescuing that fabric from its fate, in our present-day understanding of complex fabrics, as a node or distribution of nodes. We have had difficulty understanding the meaning of complexity in relation to the city: De Landa quotes the physicist George Kampis: "...the notion of immensity translates as irreducible variety of the component-types... This kind of immensity is an immediately complexity-related property, for it is about variety and heterogeneity, and not simply as numerousness."[28] What is proposed here is a framework capable of producing immensity in the structured variety of emergent place effects. What this model delivers is a framework capable of producing an endless diversity in terms of the actualization of urban place particulars – all indexed all the while to the framework itself. It is a machine for the becoming of the local urban world in all its structured particularity and specificity. "Consistency necessarily occurs between heterogeneities, not because it is the birth of a differentiation, but because heterogeneities that were formerly content to coexist or succeed one another become bound up with one another through the 'consolidation' of their coexistence or succession... What we term machinic is precisely this synthesis of heterogeneities as such."[29]

Critical attention is given to the zones and points of contact and translation between infrastructures. The technique is one for extending the reach of the network spatiality idea down to the local at the same time as it makes the infrastructural pathways of multiple movement circuits, and the relaying and coordinating functions of the points where different circuits intersect, explicit. The technique is therefore one for dealing with that most fundamental of urbanistic concerns; grounding. It is one which presupposes that grounding is produced in the successive transmission and translation of the effects of higher scaled movement processes, embedded in their infrastructures, into lower scaled infrastructures, to eventually emerge as actualized effects and events in the circuits of the most

local. This cascading effect allows us to see the scales of the global, the metropolitan and the urban as constitutive aspects of local place. The idea of a distributed intensity contained in its own grid infrastructure replaces the notion of propinquity; in fact all points on one of these grids are seen as being close at the general speed and rhythm at which that grid's intensity operates. Classic local propinquity is a product of location on a local walking speed grid. Propinquity in the contemporary city is as layered and as multi-speed are its infrastructural grids.

The urban machine, understood in this account as a characteristically urban organization of moving and potentially social, cultural and economic material, underpins the appearance of place effect 'events', which become the ontological units of our urban world. 'Events' are, as in Whitehead, microcosmic entities which grow, mature and perish in tune with the extensive surface or 'machine' which links them to the world and makes their existence and evolution possible. The machine works by operations of sorting and consolidation; firstly forming relatively even and continuous intensities, filling particular infrastructural networks. Then it generates consolidations; 'syntheses of heterogeneities' out of the diverse material delivered through those networks.[30] The productive points in the machine are the 'interfaces' where the outcome is the 'event' and the 'concrescence'.

The urban machine needs to be understood also as an instrument designed to make visible and researchable a specific problem of the city and our understanding of it; that is its absence as an active constructive force in our current models of urban and social life. The urban machine is designed to make visible and researchable the emergence of formations which are the product of this constructive agent: the city itself as a sorter and consolidator of movement and producer of a 'primitive' and corporeal situated everyday sociality. In particular it has been designed to reveal the operations by which all scales from the local to the global become imbricated in each other in a distinctively urban way, and the ways therefore everyday urban places are simultaneously global, metropolitan, urban and local. It may help us ultimately to understand better how the global and metropolitan permeate all places to differing degrees – and how local action may influence global and metropolitan structures, but not equally from all places. It may help us understand how the city itself and its everyday spatial operations are deeply implicated in the unfolding, articulation and grounding of everyday urban life.

In our dealings with the city today, we more often than not concern ourselves with phantoms, and with fantasies of chaos and disaster. The way to the city of the future is, we believe, to grasp it – to take hold of it first in our imaginations and in new disciplinary preconceptions, and then to find the will and the instruments to intervene in the interests of making sustaining and enabling urban ecologies. We need to begin to understand and to work within the laws of the city's own moving equilibrium and learn to build enriching places in the frame of what, in a complex, forceful and dynamic urban world, is necessarily so. This is as much a political as a technical task of course, but our purpose here has been to outline a technical – in the sense of instrumental and efficacious – starting point for thinking about what is, what is possible, what we may draw from the past, and what we may still have to invent when thinking of the kind of city we want to make for the future.

[1] Marc Augé (1995), *Non-places: Introduction to an anthropology of supermodernity*, trans. John Howe, Verso, London. p. 35.

[2] Bruno Latour (1987), *Science in Action: How to follow scientists and engineers through society*, Harvard University Press, Cambridge Mass. pp. 13-15.

[3] For example: A.N. Whitehead (1926), *Science and the Modern World*, Cambridge University Press, Cambridge; Albert Einstein and Leopold Infeld (1938), *The Evolution of Physics*, Simon and Schuster, New York; Peter Pesic (2003), *Seeing Double*, MIT Press, Cambridge Mass; Marc Lange (2002), *An Introduction to the Philosophy of Physics*, Blackwell, Oxford. The work of innumerable philosophers and scientists has responded to or contributed to a gradual sea-change of Cartesian-Newtonian dualism post-enlightenment (perhaps beginning with Kant!).

[4] See for example: Michael Sorkin (1992), *Variations on a Theme Park*, Hill & Wang, New York; Lieven De Cauter (2001), 'The capsule and the network: Preliminary notes for a general theory', in *OASE 54*, Uitgeverij SUN, Nijmegen.

[5] See for example: Hilary Lawson (2001), *Closure*, Routledge, London.

[6] Gregory Bateson (2002), *Mind and Nature*, Hampton Press, Cresskill NJ. p. 178, p. 102. See also: Bateson (2000), *Steps to an Ecology of Mind*, University of Chicago Press, Chicago; Bateson (1991), *Sacred Unity: Further Steps to an Ecology of Mind*, Harper Collins, New York.

[7] This is an overly sketchy construction intended simply to point to the "simultaneously real and constructed" (in the words of Latour) nature of the world. We draw mostly here on Bateson and Lawson – hopefully without doing either of them too much damage in the compression.

[8] This according to the 'neo-realist' philosophy of Gilles Deleuze and Felix Guattari. See: Deleuze and Guattari (1994), *What is Philosophy?* trans. Graham Burchell and Hugh Tomlinson, Verso, London.

[9] This is a simplification (or distortion), which we use to steer quickly past this point to the focus of the paper, of a position which involves 'folding' in Deleuze. See for example the chapter on folding in: Gilles Deleuze (1988), *Foucault*, trans. Seán Hand, Athlone Press, London. See also the paper by Deborah Hauptmann in this publication.

[10] Bateson (2000), pp. 461-2.

[11] C.H. Waddington (1957), *The Strategy of the Genes*, George Allen and Unwin, London.

[12] It should be clear that the space of the *pleroma*, as it is illustrated here is itself a *creatura* space – that we have no way of looking directly at the *pleroma* – but the point is to try to illustrate how the *pleroma* has its own space which is other than that within which we categorize and attribute meanings and thingness to events and phenomena.

[13] We draw here, again very sketchily, on Manuel De Landa's outline of the thinking of Deleuze: De Landa (2002), *Intensive Science and Virtual Philosophy*, Continuum, London.

[14] See: Manuel De Landa (undated), 'Deleuze and the open-ended becoming of the world', available at: http://www.societyofcontrol.com/library/htm_pdf/delanda_openended.htm.

> "... [T]ruth cannot be a correspondence relation between representations and a static, fixed set of beings, but an open-ended relation of isomorphism between problems as actualized in reality and problems as actualized in our bodies and minds. ... [U]nlike social constructivism, which achieves openness by making the world depend on human interpretation, Deleuze achieves it by making the world into a creative, complexifying and problematizing cauldron of becoming. Because of their anthropocentrism, constructivist philosophies remain prisoners of what Foucault called 'the episteme of man', while Deleuze plunges ahead into a post-humanist future, in which the world has been enriched by a multiplicity of non-human agencies, of which metallic catalysts, and their acts of recognition and intervention, are only one example. And, in contrast with other realist or materialist philosophies of the past (such as Engel's dialectics of nature), the key non-human agency in Deleuzian philosophy has nothing to do with the negative, with oppositions or contradictions, but with pure, productive, positive difference. It is ultimately this positive difference, and its affirmation in thought, that insures the openness of the world."

[15] See: Bruno Latour (2003), 'The promises of constructivism', in: Don Idhe (ed.) *Chasing Technoscience: Matrix of Materiality*, Indiana University Press, Bloomington.

[16] Related to the 'hylomorphic schema' or 'form-matter model'. See; Gilles Deleuze and Felix Guattari (1987), *A Thousand Plateaus*, trans. Brian Massumi, University of Minnesota Press, Minneapolis. p. 407.

[17] See the paper by Stephen Read later in this publication.

[18] See for example: Wim Nijenhuis (1994), 'City frontiers and their disappearance'; in, *Architectural Design*, vol 64, no 3/4, Academy, London.

[19] De Cauter (2001).

[20] Deleuze and Guattari (1987), p. 432.

[21] See the paper by Stephen Read later in this publication.

[22] Bruno Latour (1993), *We Have Never Been Modern*, trans. Catherine Porter, Harvard University Press, Cambridge Mass. p. 117.

[23] Jane Jacobs (1970), *The Economy of Cities*, Vintage Books, New York. See the paper by Stephen Read later in this publication.

[25] These will be treated more fully in a forthcoming publication.

[26] See for example: Maarten Hajer and Arnold Reindorp (2001), *In Search of New Public Domain*, NAi Publishers, Rotterdam.

[27] Whitehead has been an important source of ideas for understanding and constructing an 'extension' or 'surface' which is itself the cause of located 'place-effects'. See for example: A.N. Whitehead, (1919) *An Enquiry Concerning the Principles of Natural Knowledge*, Cambridge University Press, Cambridge, pp. 128-138.
'Cogredience' is the way in which multiple processes flow together to construct a single consistent, coherent, though multifaceted time-space system.

[28] See: Manuel De Landa (undated), 'Deleuze and the open-ended becoming of the world', available at http://www.societyofcontrol.com/library/htm_pdf/delanda_openended.htm.

[29] Deleuze and Guattari (1987). p. 330.

[30] Manuel De Landa (undated), 'Geology of morals', available at http://www.t0.or.at/delanda/