

Title of Paper: Indeterminacy & Self-Organisation

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Abstract

How can the nature of the city-urban be transformed into a formless, dynamic and complex condition where the indeterminate nature of landscape is offered as a replacement model of order? Can it suggest a shift from an ordered and rigid fabric, to a set of systems that operate and emerge from its existing context, which gives access to a new form of urban?

What is indeterminacy and the relationship to self-organisation?

Examples in the sciences whether they be in biology or physics, commonly offer instances of self-organisation, the notion of a swarm of bees or entropy in classic

thermodynamics suggest and act as an analogous understanding for how we perceive indeterminacy and self-organisation to operate, consequently framing it as a mechanism for dealing with transformation in urban-nature.

Urban-nature manoeuvres itself as a fluctuating device, organising and supporting an extensive range of permanent and temporal activities. The contemporary urban condition engages through new modes of organisation that function across scales from the micro to the macro, and the landscape to the built as a coherent set of systems. The landscape grafts together new forms of systematic organisations, which allow the differentiation of the self-organised urban fabric to transgress continually from its "immanent plane" into a continual state of "becoming".

How can self-organisation offer new modalities for political landscapes?

The self-organised landscape inundated with diversity and temporality consists of a finitude of fields that expand and transform according to the objective of its seeding or qualitative site conditions, adapting and emerging according to the irregular affects. The indeterminate, contextually specific condition, offers a shift from a modality, which is commonly considered as generic, to a propensity where the notion of infrastructure forms a pliant unrepeatable terrain.

The paper will attempt to address the political, social and cultural (which invariably combines and operates in the public and private), the micro and macro, the landscape and the built and endeavour to establish new territories based on the dynamic nature of a self-organised landscape. Inherent to this is an exploration which attempts to define and capture how we utilise and develop indeterminacy and a self-organised landscape-urban fabric, with the view to enable an emerging urban landscape, which is dynamic, temporal and indeterminate!

Keywords:**Time, Representation, Indeterminacy, Self organisation**

The city can be perceived as a controlled environment, *and* as matter that is in a continual state of flux, unfolding and differentiating continuously. It is influenced by cultural, historical, physical, political and environmental conditions that transform the actual organisation of the urban fabric. Johnson suggests: 'A city is a kind of pattern-amplifying machine: its neighbourhoods are a way of measuring and expressing the repeated behaviour in larger collectives - capturing information about group behaviour, and sharing that information with the group. Because those patterns are fed back to the community, small shifts in behaviour can quickly escalate into larger movements...You don't need regulations and city planners deliberately creating these structures. All you need are thousands of individuals and a few simple rules of interaction.'¹ A city can be seen as a living machine, not to be mistaken as a linear cause-and-effect, but as a "machinic" organisation where the state of the urban fabric is continually evolving at multiple scales and differentiating by site-specific occurrences.

The possibility exists to utilise and develop notions of indeterminacy and self-organization in a fabric that facilitates the urban landscape to emerge and operate as under dynamic, temporal and fluctuating conditions. This then constructs a set of circumstances that enables us to discover how the nature of the urban landscape can be embraced as a, dynamic condition that is boundless and multiple, where the indeterminacy landscape is understood and utilised as a operative tool.

¹ Steven Johnson " emergence: the connected lives of ants, brains, cities and software" pg 40

A self-organised landscape, inundated with diversity and temporality, consists of a finitude of fields that expand and transform, according to the objective of its seeding or qualitative site conditions, adapting and emerging according to the irregular affects. The indeterminate, though site -specific condition, offers a shift from a modality that is commonly considered as generic and modular to a notion of an urban landscape that is dynamic and knowledgeable.

the problems of seeing

Darcy Thompson's investigations on form begin to expose the problems of visualising the visible and invisible in landscape

The waves of the sea, the little ripples on the shore, the sweeping curve of the sandy bay between headlands, the outline of the hills, the shape of the clouds, all these are so many riddles of form, so many problems of morphology.ⁱ

Clearly, if time is real, then the principle of morphogenesis (novelty) must be sought in time, within a mobile and dynamic reality riddled with creative instabilities and discontinuities.ⁱⁱ

How can we begin to consider landscape as a 'problem of morphology' (or more precisely morphogenesis), sensation and resonance? Morphogenesis enables a landscape to be reconsidered as a continually shifting and emerging phenomena, coming into being through a series of resultant forces, some invisible and operating at various scales that allow landscape and the many layers associated to the design and existence of its to be considered as a dynamic and temporal condition. This puts forth the possibility that a landscape can continually resonate and reform in a way similar to D'Arcy Thompson's observation of the waves of the sea or the ripples on the shore, quoted above.

The operations of morphogenesis are 'the emergence and evolution of form' in landscape as a 'macroscopic examination of the morphogenesis of a process and a local and global study of its singularities, (through which) we can try to reconstruct the dynamic that generates it'ⁱⁱⁱ, thus shifting ideas of infrastructure from an inert understanding of its existence to a transformable set of inseparable singularities in a landscape process. The questioning of how landscape has the ability to engulf the idea of time into its 'technique rather than to consider time as an empowering of technique'.

This suggests a multiplicity of diverse interlinked layers of a landscapes in time, a dynamic form riddled with bifurcating sequences,^{iv} leading to complex behaviours operating at various scales.

This puts forth the idea that a landscape can be understood and differentiated by material^v operations and the complexities of time. Where time becomes the mechanism that defines possible spatial outcomes

How can we consider time differently?

Time can be reconsidered as not purely a linear and quantitative measure but a non-linear experience, where time is an emerging spatial experience, where quantity and quality are inseparable, extremely site-specific, and cannot be relocated and experienced elsewhere. Time is not controlled by image-making, but is a phenomenon of emerging structures, continually transforming into, and recreating, a multiplicity of specific moments.

Time is an emerging phenomenon relative to a particular event, or a series of moments that affect each other. These resonances evolve into another understanding of space that continually changes, beyond our control, beyond our experience and beyond our ability to articulate, continually unfolding into variable states of existence. In "*the fold*" by Deleuze, space and development are considered as the result of time being redefined as an inseparable, qualitative

and quantitative resonance of matter. Time becomes space, where time is dynamic, emerging and redefining itself continuously. 'With the fold a fluctuation or deviation from a norm replaces the permanence of a law, when the object assumes its place in a continuum of variation. " The object acquires a new status when it refers no longer to a spatial conception of moulding, but a "temporal modulation or a "continuous variation of matter."'²

An event is an unfolding state of 'being', an accumulation of variable time. This is a shift from the notion of an event as singular and objectified, to one that is a complex set of relationships, continually evolving and existing in variable states. The event, self-organisation and indeterminacy are clearly imbricated with one another, where indeterminacy and self-organisation are actions that describe the specific qualitative understanding of an event.

The physical outcomes that we experience are resonances of multiple events in time.

The understanding resonance facilitates the emergence of time not purely as 'contracted quantity'; rather, it allows us to perceive time beyond the singular or binary opposites, beyond the duality of the homogeneous quantity and heterogeneous quality and to pass from one to other in a continuous movement.'

^{vi} Time is realised and articulated as complexities, making operation and magnitude inseparable.

The flows and sensation defines an unclaimed space, shifting the categorical definitions of landscape to differentiated qualities of becoming:

...landscape is a system where a point of change is distributed smoothly across a surface so that its influence cannot be localized at any discrete point...The slow undulations that are built into any landscape surface as

² Gilles Deleuze "the fold" pg xix

hills and valleys do not mobilize space through action but instead through implied virtual motion... The landscape can initiate movements across itself without literally moving. The inflections of a landscape present context of gradient slopes, which are enfolded^{vii}

This suggests that we shift our ideas about representing fragmentary systems of, landscape, and the built environment, and rather, consider these organisations as sets that influence each other and result in a landscape that is spatially derived from both the virtual and real concepts of change and time. This reinforces the investigation of D'Arcy Thompson's problem of morphology, as shifting planes and territory are differentiated by material difference and qualitative performance.

What is indeterminacy and its relationship to self-organisation?

Urban-nature manoeuvres itself as a fluctuating device, organising and supporting an extensive range of permanent and temporal activities. The contemporary urban condition engages through new modes of organisation that function across scales from the micro to the macro as a coherent set of systems. The urban landscape grafts together new forms of systematic organisations, which allow the differentiation of the self-organised fabric to transgress continually its 'immanent plane' to a continual state of 'becoming'.

In science, indeterminacy is defined as the potential area contained within the maximum and minimum degrees of its fluctuating state. In quantum physics, indeterminacy is concerned with the predictability of events, for example 'by representing an indeterminate instant with a set of continuous chronons, and a probability distribution over that set, it is possible to characterise a large number of alternatives, to devise intuitive query language constructs.'³

³ Quantum mechanics/ quantum indeterminacy can be considered as four variable types: 1. Quantum indeterminacy, indeterminacy due to chaos theory as described in chaos theory. 2. Indeterminacy caused by limited powers of observation. 3. Limitations due to nature of human memory and thought processes.

Koolhaas' proposal for Downsview Park suggested that the urban park proposition was indeterminate. Koolhaas and Mau dealt with indeterminacy as the extent of design resolution or the lack of design. Indeterminacy was used as a metaphor for the design, rather than as action or a state of being. Prigogine and Kauffmann discovered this in science, as did John Cage in music, and Deleuze in philosophy. The design proposition dealt with the quantitative construct of the urban strategy. Thanks to Mau's professional investigations into graphic communication, an iconic representation was proposed, alleviating the burden of traditional architectural representation of urban strategies. As a consequence, the final outcome separated the influence of the quantitative and the qualitative understanding of time and indeterminacy. The proposition, in turn, reduced time back to its linear and Cartesian understanding, rather than as the origin of indeterminacy, suggesting a dynamic complex process. A compelling aspect of the Koolhaas's and Mau proposition is the suggested transformation of architectural language, reviving an exploration of how we communicate (read and write) as designers.

"How to engage all the complexity and indeterminacy of the city through the methods of a discipline so committed to control, separation and unitary thinking? We thrive in cities exactly because they are places of the unexpected, products of a complex order emerging over time.'⁴

Allen suggests that architecture and planning need to recognise the limits of their ability to order the city, and that they learn from complex self-regulating orders already present in the field of the city. With growing recognition of the urban field, architectural objects tend to lose their traditional form and design process, moving from the one toward the many, and from objects to fields.

In Corner and Allen's proposition for Downsview Park, titled 'Emergent Ecologies', they were unable to identify time through the titled ecological

⁴ Stan Allen" Point and Lines: diagrams and projects for the city"

understanding of time and the desired ambition to incorporate ideas of self-organisation. This is clearly a link to the resonating possibilities or the maximum potential 'states of being' that would have been identified. Self-organisation and emergence does not suggest or speculate a singular probable outcome, in a completely deterministic manner.

A self-organised landscape, inundated with diversity and temporality, consists of a finitude of fields that expand and transform, according to the objective of its seeding or qualitative site conditions, adapting and emerging according to the irregular affects. The indeterminate, contextually-specific condition offers a shift from a modality that is commonly considered as generic, to a the notion of an urban landscape as dynamic and knowledgeable, suggesting a collaborative approach between man and nature.

ⁱ D'Arcy Thompson (1961) *On Growth and Form*, Cambridge: Cambridge University Press. Pg 32

ⁱⁱ Kwinter, Sanford(2001) *Architectures of Time: Toward a theory of the event in modernist culture*, Cambridge: MIT Press. Pg 10

ⁱⁱⁱ Rene Thom (1975) *Structural Stability and Morphogenesis*, Massachusetts: Advanced Reading Program. Pg 7

^{iv} Bifurcations not as the binary change, but as model for the multiple possibilities of change.

^v Material as a operative device where the material at different scales is understood.

^{vi} *ibid.* pg 74

^{vii} Greg Lynn (1999) *Animate Form*, New York: Princeton Architectural Press. pg 29