

## ***Aesthetics as an adaptive system.***

### ***An evolutionary approach on aesthetics and sustainable city design***

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#### ABSTRACT:

Sustainability, while being definitely a new form of humanity, in many urban and landscape projects, often lacks of an essential characteristic of the anthropic space: **seduction**. The ‘Sustainablecity’ has to find its own power of seduction if it is to compete successfully with the ambiguous but established charms of the unsustainable city. Dealing with this theme, we should care not just about the ethic dimension but also about aesthetics, style and emotions, the essential elements of seduction that have historically made the city so attractive, and have much to do with excess and exuberance, with surplus production, conspicuous consumption and with waste. From all the above it is clear the importance of the ‘Aesthetic of Sustainability’ as fundamental for the success of a **new model of green planning**.

In *The three Ecologies* Guattari condemns the notion of ecology simply related to the environment in a sort of synonymic equation as too reductive and too dangerous. He adds: “*We need to apprehend the world through the interchangeable lenses of the three ecologies. Such ecologies are governed by a logic of intensities which concerns itself solely with the movement and intensity of EVOLUTIVE PROCESSES*”.

This line of thought introduces the idea of ecologies within the neo-Darwinian framework of Evolution, where a link between ecology and aesthetic already exist: ‘*aesthetic emotions are a major component of how humans solve problems*’. Hence, in the evolutionary approach, it seems to be possible to define **aesthetics as an adaptive system**. Following this framework where small changes can lead to big effects, rediscovering the potential of incremental and spontaneous variations on a vast scale we could consider **the Bottom Up/Self Organized approach as a possible morphogenetic process for sustainable city design**. As a matter of fact “*self-organized cities are cities that seek to fill their space in the most efficient manner following rules of self-similarity that show how they arrange their parts to conserve and utilize the transport of their energy in the most efficient way*” (Langley).

There is indeed a call for a new hermeneutics which would bring along a new aesthetic according to the ‘fundamental law about the creation of complexity: highly successful [systems] are generated structures, not fabricated structures’. New models are required in order to digitally breed cities, models that can be borrowed by other disciplines like biology, genetics, economy: *sugar-scape models, allometric models, stigmergic models*. As form of self-organization they produce intelligent structures and support efficient collaboration. In this light good design can emerge from continual feedback, strengthening the best within the design process and deleting the worst: back to the concept of **Aesthetics as adaptive systems, major component of human problem solving behavior**.

At the moment on the international level there would not seem to be a clear and coded position in order to recognize a specific language and/or aesthetic in the sustainable design of city and territory. More specifically Sustainability, while being definitely a new form of

humanity<sup>1</sup>, in many urban and landscape projects, often lacks of an essential characteristic of the anthropic space: **seduction**. It has developed a series of rules more similar to a 'best practice' approach, rather than a solution with clearly recognizable aesthetic values. Manifestos like '*One Planet Living Community*' or the '*Triple Bottom Line*' and many others exist, but, apart from being too many, they just encode a series of points, a dogmatic and little seductive vision of a sustainability expressed more through new technological performance rather than through a new urban language. I believe that '*Sustainablecity*' has to find its own power of seduction if it is to compete successfully with the ambiguous but established charms of the unsustainable city.

Talking about it as an ethical necessity is a given, but while dealing with this theme, we should also care about aesthetics, style and emotions, the essential elements of seduction that have historically made the city so attractive, particularly the capitalistic city, and have much to do, paradoxically, with excess and exuberance, with surplus production, conspicuous consumption and with waste. In formal terms when we deal with Sustainability we deal as well with a sort of radicalization: a logic based on composition and tectonic-morphogenetic research has been replaced by one aesthetically impoverished and diminished, where functional rigidity, codified by a series of norms, place the ethic as the ultimate irreplaceable value. From all the above it is clear the importance the 'Aesthetic of Sustainability' as fundamental for the success of a **new model of green planning** and not just from an environmental and economic point of view.

In the Ecosophical treatise '*The three Ecologies*' Guattari was advocating a similar position: the increasingly deteriorating condition of human relationships with its surroundings is due not only to the pollution and the objective damage that belongs to this, but to the most worrying praxes of regarding '*action on the psyche, the socius, and the environment as separate*'<sup>2</sup>. Guattari condemns the notion of ecology simply related to the environment in a sort of synonymic equation as too reductive and too dangerous. He adds: "*We need to apprehend the world through the interchangeable lenses of the three ecologies.*" Such ecologies are governed by a logic of intensities which '*concerns itself solely with the movement and intensity of EVOLUTIVE PROCESSES*'<sup>3</sup>.

This line of thought is important because introduces the idea of ecologies within the neo-Darwinian framework of Evolution, where a link between ecology and aesthetic already exist. According to G.H. Orians<sup>4</sup>, in fact, results from existing studies have undoubtedly demonstrated the power of an evolutionary approach to aesthetics: "Humans have strong emotional responses to living organisms and to natural and human-modified environments. [...] These powerful emotions, which are the foundations of aesthetics, [...] have been designed by evolutionary processes". He specifies that 'aesthetic emotions are a major component of how humans solve problems'. Even C. Marchetti<sup>5</sup> shares the idea that aesthetic responses are 'fundamental to the ways in which organisms know about and adapt to the world'<sup>6</sup>. If aesthetic responses evolved because they enabled people to better solve life's problems, exposure to high quality environments should, at least, be restorative and this brings us back to the link between aesthetics and ecologies. Hence, within the evolutionary approach, it seems to be possible to define **aesthetics as an adaptive system**.

The same approach, interestingly enough, is at the base of the birth of the sustainable agenda in city planning. When in 1915 Patrick Geddes published '*Cities in Evolution*', where he first introduced the concept of ecology and sustainability within city design and planning, he was trying to fight against the social and environmental chaos and evil of the spontaneous (read:

Bottom–UP) sprawl of the city after the industrial revolution. He was the first one to consider the city as an environment which could influence, positively or negatively, the organism it contained and in doing so he was promoting a certain aesthetic quality of the city space and at the same time he was linking social evolution to spatial design and quality of the environment as in ‘The Three Ecologies’. Even though his method can be clearly described as a TOP DOWN approach to planning, his book was also the first publication to shift the accent from a developmental paradigm to an evolutionary one, following the neo-Darwinian framework where **small changes can lead to big effects**: from predictable to unpredictable, from form to function, from structure to process<sup>7</sup>.

The Top Down approach promoted by Geddes was challenged for the first time in the 60’s by people like Jane Jacobs and Christopher Alexander, who both had rediscovered the potential of small incremental and spontaneous changes on a vast scale as per the evolutionary paradigm. Jacobs in 1961 declared that “*the diversity of cities that marked their quality is the diversity that was formed from countless individual decisions, generated from the bottom up*”<sup>8</sup>: a logic association between quality, hence aesthetic, if we consider proper the definition according to which there is aesthetic ‘anywhere the qualitative processes of reception and production, of pleasure and making are examined’<sup>9</sup>, and the evolutionary bottom up model. The trend towards the re-appropriation of the Bottom Up model had a final push in the ‘80s with the formulation of the Complexity Theory and the need to incorporate the ‘uncertainty factor’ about the outcome of the process of change.

The physical trace of such complexity is the hallmark of **self-organization**.

Such a passage becomes even more remarkable if seen in concomitance with the interest for clean and renewable energies which seems to flourish in about the same years. If we look at history as a sequence of different human metabolic systems we see that the type of energy resource men used to draw on in the first two metabolic systems<sup>10</sup> by acting on the biophysical matrix processes in their territory was always a cycle of production and consumption limited to the biosphere<sup>11</sup>. With the access to mineral resources, the lithosphere, the sustainable cycle of production and consumption got broken. Curiously enough the type of prevailing city models in the first two cases was a Bottom Up one, which was substituted by a Top Down one after the Industrial revolution<sup>12</sup>. The research towards new types of energies, shifted again in the biosphere realm, seems to have been accompanied by a renewed awareness of the potential of the Bottom up model of city planning, a more complex and emerging mode of action.

In this light we could consider the Bottom Up/Self Organized approach as a possible morphogenetic process for sustainable city design. But what is exactly the self-organized city and how is this model suitable with the sustainable agenda and its possible aesthetics? According to Peter Langley<sup>13</sup> “*self-organized cities are cities that seek to fill their space in the most efficient manner following rules of self-similarity that show how they arrange their parts to conserve and utilize the transport of their energy in the most efficient way*”. On the same line Michael Batty<sup>14</sup> argues: “[*The self-organized cities are*] *models of cities simulating morphologies that are surprising in that their form cannot be anticipated from the assumptions and processes adopted in their representation. [...] It is a consequence of the complexity approach that appropriate models should provide “information” rather than “solutions,” should “inform” rather than “solve.”*

The main differences between a ‘Self Organized-Bottom Up’ model and an ‘Organized-Top Down’ one could be summarized in eight couples of opposite modes: apart from the

tautological Self organized Vs Organized ,we could add Stochastic Vs Deterministic, Far from Equilibrium Vs In Equilibrium, Characterized by a Decentralized decision making Vs Characterized by a Centralized Decision making, Surprise and Novelty expressed in the language of transition Vs Predictability, Emergent Vs Founded, Topologic Vs Discreet, Heterogeneous Vs Homogeneous.

The notion that cities are always ‘out of equilibrium’ and are constituted by a multitude of bottom up decisions leads to the recognition of the need to offer solutions which would allow various elements of design to self-organize, guaranteeing a margin of improvisation, so that architecture, city and anthropic landscape could be understood and designed as ‘amalgams of processes’ ,spaces of vectorial flows which modify and adjust themselves according to some inputs, as self-generating systems, open languages of fluid and dynamic aesthetic based on the logic of biotopes, ecosystems and ‘loop structures’.

There is a need for a new hermeneutics which would bring along a new aesthetic according to the ‘fundamental law about the creation of complexity: highly successful [systems] are generated structures, not fabricated structures<sup>15</sup>’. New models are required in order to digitally breed cities, models that can be borrowed by other disciplines like biology, genetics, economy: *sugar-scape models*, *allometric models*, *stigmergic models*.

As form of self-organization they produce intelligent structures and support efficient collaboration. In this light good design can emerge from continual feedback, strengthening the best within the design process and deleting the worst: back to the concept of **Aesthetics as adaptive systems, major component of human problem solving behavior.**

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<sup>1</sup> The fourth human metabolic system, meaning as first human metabolic system the hunters-gathers society, as second human metabolic system the agricultural society and as third one the industrial revolution.

<sup>2</sup> F.Guattari, *The three Ecologies*, Continuum International Publishing Group – Athlone, July 2000

<sup>3</sup> F.Guattari, *The three Ecologies*, Continuum International Publishing Group – Athlone, July 2000

<sup>4</sup> Professor Emeritus of Biology at the University of Washington, USA

<sup>5</sup> Senior Scientist at the International Institute for Applied Systems Analysis in Laxemburg, Austria

<sup>6</sup> C. Marchetti, *Notes on the limits of knowledge explored with Darwinian logic. Complexity* 3, 22-35, 1998

<sup>7</sup> M. Batty, *Darwinism, Evolution and the Development of cities*, Talk to 2nd Year UG Bartlett Planning Students Thursday, 25 November 2010

<sup>8</sup> J.Jacobs, *Death and Life of Great American Cities*, Random House, New York, USA,1961

<sup>9</sup> Franzini Elio e Mazzocut-Mis Maddalena, *Estetica*, Mondadori, Milano 1996

<sup>10</sup> See note 1

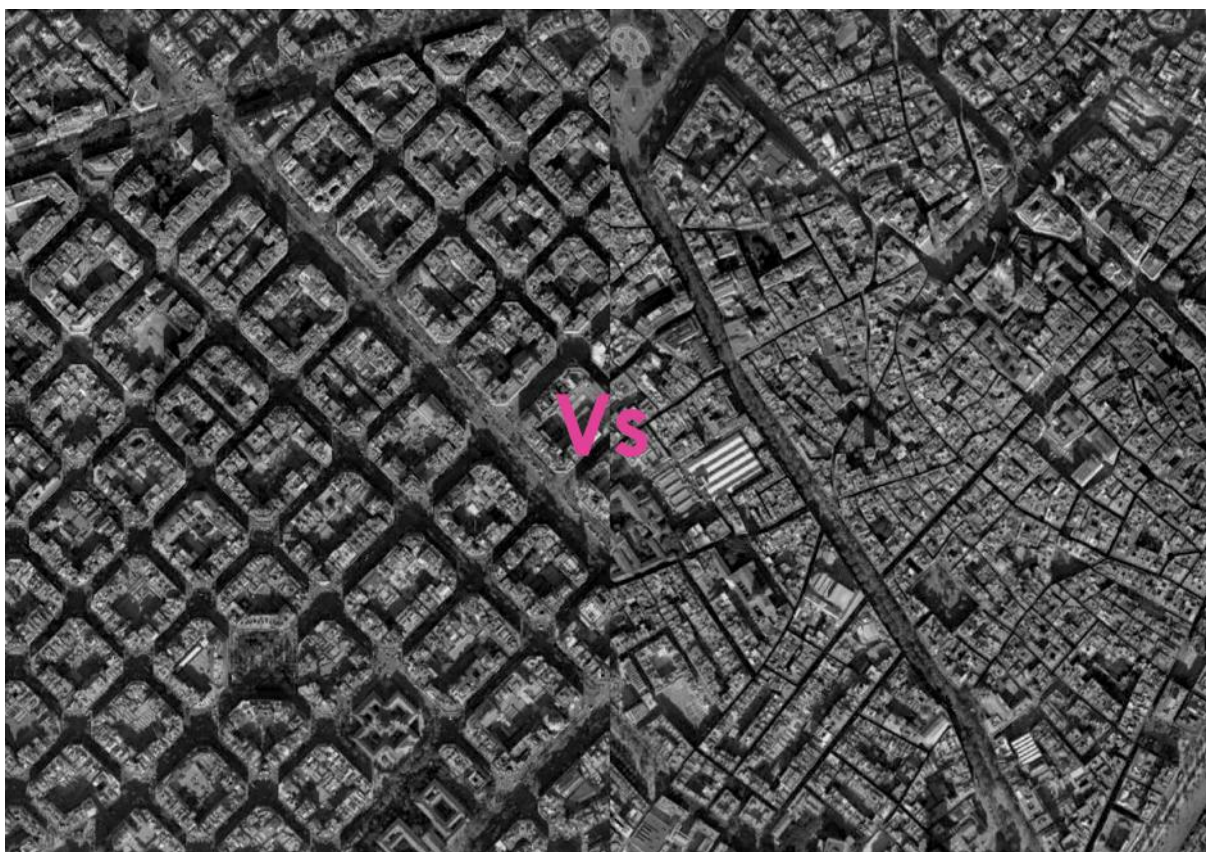
<sup>11</sup> This was due to the fact that the biosphere was not able to metabolize the unwanted waste coming from consumption of the lithosphere materials

<sup>12</sup> S. Rueda, Climate Change: urban projects to mitigate greenhouses gases, paper from web, 2008

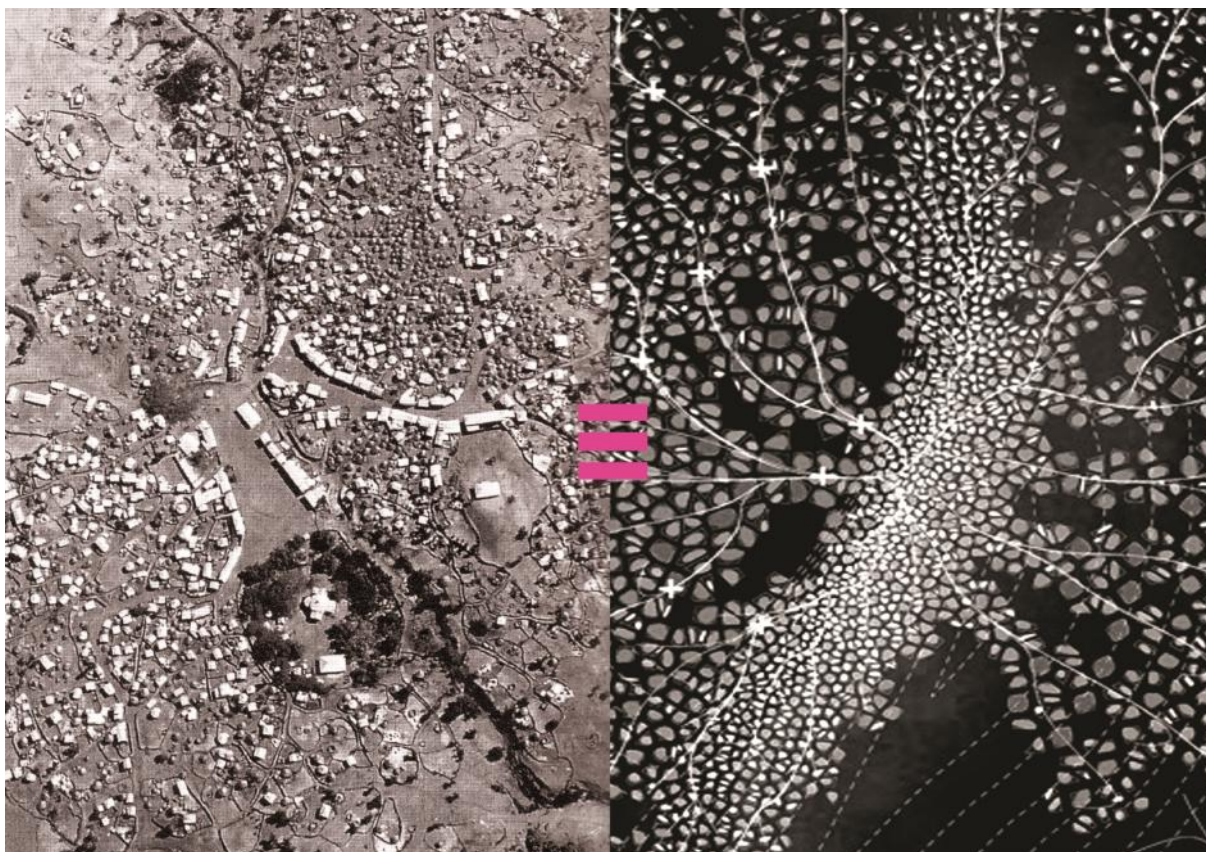
<sup>13</sup> Professor of Geographic Information Science at the Bartlett, University College London, UK

<sup>14</sup> Professor of Planning at the Bartlett, University College London and Director of the Centre for Advanced Spatial Analysis, UK

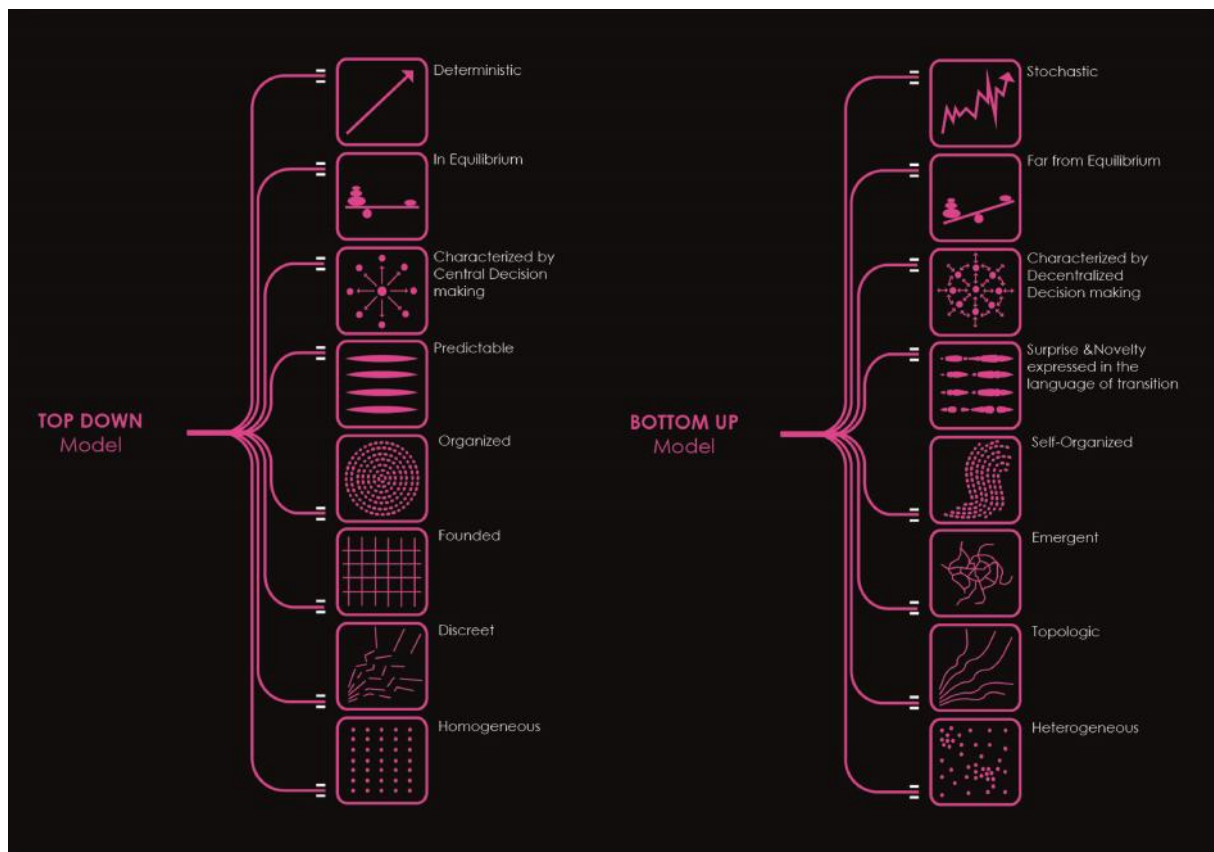
<sup>15</sup> C. Alexander, *The Nature of Order, Book 2: The Process of Creating Life*, Center for Environmental Structure, Berkeley, CA



1. Barcellona: Top Down planning (Eixample) vs Bottom Up (Barrio Gótico)



2. Left: Aerial view of a primitive village, Sakota, (Africa): typical example of spontaneous bottom up urban growth, Right: Emerging self-organized urban patterns generated by an algorithm (© Shi Qui Ng\_Intermediate10\_AA)



3. Top down vs Bottom Up mode



4. Aesthetics as Adaptive System

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