

## TOWARDS A BIOLOGICAL UNDERSTANDING OF ARCHITECTURE AND URBANISM: LESSONS FROM STEVEN PINKER.

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Architecture is indeed linked to biology. This observation is intuitively true from a structural perspective, since human beings perceive a kinship between the different processes -- natural and artificial -- that generate form. Nevertheless, the broadness of the claim might appear surprising, considering that it comes from architects holding radically different ideas about what buildings ought to look like. The idea of a biological connection has been used in turn by traditional architects, modernists, postmodernists, deconstructivists, and naturally, the "organic form" architects. One might say that architecture's proposed link to biology is used to support any architectural style whatsoever. When it is applied so generally, then the biological connection loses its value, or at least becomes so confused as to be meaningless. Is there a way to clear up the resulting contradiction and confusion?

Up until now, architects and those scientists interested in architecture have focussed on the morphological imitation of nature. Sometimes explicitly, more often implicitly, natural forms, including biological forms, have inspired the constructions of human beings. (This topic is being studied by the architect and author Lucien Steil in a major project now underway). Nevertheless, I believe that an understanding of the biological roots of architecture and urbanism requires another component that is independent of structural imitation. This more elusive aspect of the problem is concerned with how we connect and perceive form to begin with. As such, it has more to do with our own internal structure as human beings than with more general biological structures. The answers are to be found in cognitive processes, perception, and neurophysiology.

In order to begin a search for how biology influences architecture and urbanism, we must establish some overall map of the problem. Because this is a vast subject, it is useful to divide it into a series of questions like the following. This is not meant to be a complete set of questions; only a starting point for an investigation.

1. Why do some built forms resemble biological forms?
2. What types of built forms correspond more closely to biological prototypes?
3. Are human beings predisposed to like and feel comfortable with certain types of forms?
4. Are human beings also predisposed to *build* certain types of forms?
5. Is it worthwhile mimicking biological forms in what we build?
6. Do we gain more than just aesthetic pleasure -- such as physical and psychological benefits, for example -- from an environment that captures the essence of biological structure?
7. Can we damage ourselves by living in and around forms that contradict biological forms?
8. Do we really understand biological structure well enough to mimic anything other than its superficial appearance?

These questions can hopefully provide researchers with an impetus to resolve long-standing problems in how mankind relates to its natural and built environments. I would like to focus here on the connection between architecture and urbanism, on the one hand, and inherited structures in the human brain that influence the function of "mind", on the other. A group of innovative architects and thinkers are beginning to formulate the basis for a new architecture that arises out of human needs, and which is supported by an improved understanding of biological structure. Our cognition makes us human; it is certainly responsible for how we perceive structure. Human neurophysiology is therefore essential for answering at least some of the above questions. For guidance in this task, I turn to the work of Steven Pinker, Professor of Psychology at MIT, a world authority on cognitive neuroscience, and the author of "*The Language Instinct*" and "*How the Mind Works*".

Steven Pinker's most recent book, "*The Blank Slate: The Modern Denial of Human Nature*" [1], raises issues that are central to our discussion. (Pinker has also given an interview on his new book [2]). He posits that the modernist movement permeating the arts, architecture, urbanism, philosophy, and the social sciences propagated a monumental deception about the nature of the human mind -- namely, that the mind has no "hard-wired" components, hence everything that defines it is socially imprinted. This assumption is called "the blank slate", referring to the notion that a human being starts with no inborn preferences, and thus acquires all neuronal structures exclusively from external sources. This assumption, upon which so much in the twentieth century has depended, is demonstrated to be false. Pinker argues that, believing it was true, architects, planners, politicians, and others gave themselves permission to try and reshape our world according to their own ideology. That meant ignoring what human beings really need from a biological point of view.

In a book of 500 pages, Pinker devotes only about a page or so to architecture and urbanism, but the point is that he is scathingly critical of the modernist, postmodernist, and deconstructivist approaches. This is moreover not a philosophical discussion, but a biologically-based refutation of the intellectual underpinnings for a significant and entrenched establishment. *"The belief that human tastes are reversible cultural preferences has led social planners to write off people's enjoyment of ornament, natural light, and human scale and force millions of people to live in drab cement boxes. ... the conviction that humanity could be reshaped by massive social engineering projects led to some of the greatest atrocities in history."* [1] (pages x-xi).

Pinker underlines the disastrous consequences of turning against human nature. In particular, he examines the arrogant state of mind that makes that possible, arguing for a connection between modernist planning and totalitarianism. *"Inborn human desires are a nuisance to those with utopian and totalitarian visions, which often amount to the same thing. ... Authoritarian High Modernism [is] the conceit that planners could redesign society from the top down using 'scientific' principles. The architect Le Corbusier, for example, argued that urban planners should not be fettered by traditions and tastes, since they only perpetuated the overcrowded chaos of the cities of his day. ... Le Corbusier was frustrated in his aspiration to flatten Paris, Buenos Aires, and Rio de Janeiro and rebuild them according to his scientific principles. But in the 1950s he was given carte blanche to design Chandigarh, the capital of the Punjab, and one of his disciples was given a clean tablecloth for Brasilia, the capital of Brazil. Today, both cities are notorious as uninviting wastelands detested by the civil servants who live in them. Authoritarian High Modernism also led to the 'urban renewal' projects in many American cities during the 1960s that replaced vibrant neighborhoods with freeways, high-rises, and empty windswept plazas."* [1] (pages 169-171).

This accuses architects, urbanists, and legislators for acting contrary to the biological nature of human beings. As such, it helps to solidify the arguments of anti-modernist critics such as Jane Jacobs [3], Christopher Alexander [4,5], and Léon Krier [6,7], by providing them with a biological foundation. *"City planners believed that people's taste for green space, for ornament, for people-watching, for cozy places for intimate social gatherings, were just social constructions. They were archaic historical artifacts that were getting in the way of the orderly design of cities, and should be ignored by planners designing optimal cities according to so-called scientific principles. Le Corbusier was the clearest example. He and other planners had a minimalist conception of human nature. A human being needs so many cubic feet of air per day, a temperature within a certain range, so many gallons of water, and so many square feet in which to sleep and work. ... Ornamentation, human scale, green space, gardens, and comfortable social meeting places were written out of the cities because the planners had a theory of human nature that omitted human aesthetic and social needs."* [2]

While Pinker's book [1] is not about architecture and urbanism, it does open the door to what is inevitable; namely, a scientific debate of what type of architecture is more in tune with biological precedent. By focussing on how the human mind reacts to form and environment, the investigation turns away from the imitation of nature, and complements those studies in an important fashion. We need further research to reveal the biological basis for architecture. That is a monumental task, yet an important first step has now been made. When the job is finally accomplished, and we understand how architecture depends on the structure of our own mind, we will be in a better position to tie together many of today's non-mainstream movements in architecture and urbanism. These encompass practices such as New Urbanism, traditional and neoclassical architecture, the work of Christopher Alexander and Léon Krier, and the work of many other thinkers, developers, and builders who have instinctively pursued a more humane architecture.

It is becoming increasingly clear that architectural value is indeed founded on shared aspects of the human mind. Such a universality relies on innate neural circuitry common to all human beings [2]. That's the opposite to what has been proposed in the architectural literature of the past several decades -- namely, that value rests strictly on individual preferences. Those arguments are part of an intentional deception meant to justify the careers of certain architects (who have become prominent thereby). Architectural value is definitely not in the mind -- and the eye -- of the beholder, as defined by one's personal idiosyncrasies.

For the last twenty years, design based on human needs has had to compete against the more intellectually-based design of the deconstructivist school. The latter, moreover, lately brings with it the claimed support of the "new sciences", such as fractals, nonlinearity, emergence, and complexity theory [8,9]. Formal concerns have taken both architectural theory and practice into more rarefied designs that are far removed from the early modernist canon. Their proponents claim that these architecturally unusual forms are in fact more organic. Pinker, however, argues that the deconstructivist philosophy upon which those architects depend is totally unscientific. It is thus unlikely that following deconstructivist thought could possibly bring architecture any closer to biology.

Some reviewers of this seminal book have brazenly stated that *"no modern scientist believes in the blank slate anymore"*, as if to imply that Pinker is arguing about outdated topics. Nothing could be further from the truth! Our society tries to understand its own structure, and builds its physical extensions on the earth's surface, guided by the blank slate hypothesis. This conceptual error is therefore mirrored not only in our societal structure, but most importantly in the built environment. It is there that one has

to look for the greatest damage this mistaken idea has wrought to our civilization. It is also here -- in the physical form of new buildings and regenerated urban fabric -- that the first corrective steps will be most helpful.

"The denial of human nature has spread beyond the academy and has led to a disconnect between intellectual life and common sense. ... The problem is not just that these claims are preposterous but that the writers did not acknowledge they were saying things that common sense might call into question. This is the mentality of a cult, in which fantastical beliefs are flaunted as proof of one's piety. That mentality cannot coexist with an esteem for the truth, and I believe it is responsible for some of the unfortunate trends in recent intellectual life. One trend is a stated contempt among many scholars for the concepts of truth, logic, and evidence." [1] (page x). Pinker is referring to contemporary philosophical trends such as deconstructivism, now popular in academia. He exposes them in a debunking that is just as effective as that of Sokal and Bricmont [10], but coming this time from neurophysiology and cognition rather than from physics.

## References.

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[3] Jane Jacobs, *The Death and Life of Great American Cities*, Vintage Books, New York, 1961.

[4] Christopher Alexander, "[A City is Not a Tree](#)", *Architectural Forum*, vol. 122, pp. No. 1, pages 58-61 and No. 2, pages 58-62, (1965). Reprinted in: *Design After Modernism*, Edited by John Thackara, Thames and Hudson, London, 1988, pp. 67-84. Available from <<http://www.rudi.net/bookshelf/classics/city/alexander/alexander1.shtml>>

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[6] Léon Krier, "[The City Within the City](#)", *A + U*, Tokyo, Special Issue, November 1977, pages 69-152. Reprinted in: *Architectural Design*, volume 54 (1984), Jul/Aug pages 70-105. Available from <<http://applied.math.utsa.edu/krier/city.html>>

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[8] Nikos Salingaros, "[Charles Jencks and the New Paradigm in Architecture](#)", *Katarxis III* <www.katarxis.com> March 2003, available from <<http://applied.math.utsa.edu/~salingar/newparadigm.html>>.

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[10] Alan Sokal and Jean Bricmont, *Fashionable Nonsense*, Picador, New York, 1998. European title: *Intellectual Impostures*.