News from Nowhere
A Biological Reading

There is a principle in the biological field of niche construction that neatly sums up the future of design practice. Just as we alter our material or designed environments, these environments, in turn, alter the genetic, cognitive, and cultural expressions of who we are. From this perspective, architectural design is fitting or attuning of the built environment to the embodied, multisensory human organism. Design is grounded not in technologies or utopian ideologies, but in the paradisiacal instinct for well-being and happiness.

News from Nowhere, the novel written by the nineteenth-century craftsman, poet, and artistic philosopher William Morris, should be required reading for every first-year design student. Published in 1890, the novel's setting is London sometime in its idyllic future, at a time when the city has returned to its medieval landscape. On the time-traveler's first horse-drawn, carriage ride into town, he spies Westminster Abbey within the glade of a forest. The orchard planted in Trafalgar Square is spotted from among "whispering trees and odorous blossoms," and the British Museum is first seen from a "narrow lane between the gardens," opposite a "wide space of greenery, without any wall or fence of any kind." All of London, in fact, has become Edenic, and the few surviving monuments, all deemed "ugly" by its aesthetically more discerning residents, are left standing only because they provide adequate housing or, like the British Museum, have a saving grace of a grand library. The House of Parliament, in a social system that has evolved beyond the need for a government, is fittingly used as a dung-

market. Morris's portrait of paradise is predicated not on how we can afford a well-designed environment, but on what a well-designed environment affords us.

The idea of "affordance" is prevalent today in architectural literature. It was a concept coined by James Gibson in his book *The Ecological Approach to Visual Perception* (1979), where he used the term to refer to what the environment "*provides* or *furnishes*" an animal.[1] People generally prefer environments with many affordances—the opportunity to walk, ride a bicycle, or take the Underground. Andy Clark defines affordance as "the 'fit' between the agent's physical structure, capacities and skills and the action-related properties of the environment itself."[2] Gibson made one other distinction that is useful to designers—that between a *habitat* and a *niche*. The habitat refers to "*where*" an animal lives, while the niche refers to "*how*" the animal lives.[3] This raises an interesting question: Are we, as architects and planners, designing habitats or niches?

A couple of decades after Gibson's book appeared, the anthropologist Tim Ingold followed with a similar observation by differentiating between the "building perspective" and the "dwelling perspective." The former, he noted, is generally "the architect's perspective: first plan and build the houses, then import the people to occupy them." Yet his attitude, he pointed out, is the reversal of Martin Heidegger's etymological priority, which argued that "*only if we are capable of dwelling, only then can we build*."[4] From this perspective, design, for Ingold, becomes taking into account the "animal-in-its-environment" rather than the abstraction of the occupant.[5]

Ingold in the 1990s made his case because he was challenging another dubious underpinning of twentieth-century thought, that divide between nature and nurture. In the older view, nature is our genetic or biological inheritance, and culture is the sum of forces humans have erected to moderate or mitigate our behavioral tendencies. Newer models of genetics have a very different take on the issue by depriving genes or culture of any primacy. We now know that human organisms are in a continuous state of re-

creation, as it were, in which the forces of genes, environments, social, and cultural factors affect the expression of one another.[5] Saying this another way, the human dweller is not a fixed biological entity and must be taken within our ever-changing environmental, social, and cultural contexts. As Evan Thompson and Francisco Varela have articulated this point: "The nervous system, the body and the environment are highly structured dynamical systems, coupled to each other on multiple levels. Because they are so thoroughly enmeshed—biologically, ecologically and socially—a better concept of brain, body and environment would be as mutually embedded systems rather than as internally and externally located with respect to one another."[6]

II. What Constitutes a Good Environment?

Let us give some heft to the notion of the human dweller by considering how these "highly structured dynamical systems" work with one another. At its most basic level, design follows a simple goal: the homeostatic regulation of the human body within a built environment. A designed environment maintains the human organism within a relatively well-established range of comfort levels, such as temperature, humidity, and task illumination. We know that some designed environments fulfill these criteria better than others. Over the past half-century, many studies have also established the deleterious effects of poor environments: higher rates of morbidity, obesity, disease, depression, stress, crime, drug addiction, alcoholism, asocial behavior, and psychological disorders. Yet what constitutes a good environment?

This question can be pursued in many directions. Studies of rodents raised in enriched environments, for example, suggest that good environments improve sensory, cognitive, and motor functions, lead to greater synaptic development and increased gray matter, and enhance memory networks. Yet what defines an optimally enriched environment, and do we have the means at hand to assess it? Not today, definitely,

although it does not take a host of biological studies to understand our urge, as Jan Gehl has shown, to move beyond our dull and poorly scaled urban landscapes.[7]

Yet there is another area in which significant knowledge has been gained over the past quarter-century, which does have something to offer the designer. This is our better understanding of how the human organism perceives or aesthetically couples with the built environment. In recent years neuroscience has learned much of the workings of our proprioceptive and kinesthetic systems, our visual, navigational and place-mapping systems, as well as of our auditory, memory and olfactory systems. Equally significant are the major insights into our sensorimotor mirror systems, and their connection our emotional and hormonal systems. Let us briefly explore these last two worlds.

The discovery of mirror systems in the 1990s was a pivotal event for designers. Succinctly, mirror systems are neural areas of the brain that become active—through a process known as embodied simulation—with sensory stimuli. If one sits and listens to a piano, for example, areas of the secondary motor cortex involving the potential movement of fingers become active, as if one were playing the piano. In studying a painting or a work of sculpture, we might simulate the brush strokes on the canvas or the force of the chisel struck by a hammer. Embodied simulation is often referred to as empathy, and it is the reason that we feel an accord, on several levels, with Laocoön, that Trojan priest who tried in vain to defend himself and his sons against the serpents sent by Athena. We neurologically struggle with the serpents as if those parts of *our* bodies were under attack. More recently, we have learned that we simulate something as innocuous as the lines of an abstract painting.[8] If this is true for a two-dimensional canvas, what does it suggest for the lines and spaces of our built environments?

Although architecture is a multisensory experience difficult to capture with current imaging technologies, models of embodied simulation nevertheless provide important clues. The first is simply the recognition that every designed environment is a

whole-body experience in which materials, forms, and spaces (and their landscapes) should find an empathetic accord with the human organism. People immediately grasp the affordances of their environments, and a building's materials, forms, and space are not neutral. We have an affinity with certain materials, and a dislike of others. We simulate architectural forms through their materiality, gravitational weight, density, texture, color, projected movement, sound, olfaction, depth, and layering of effects. We sense, we measure, and we simulate a room's spatial parameters with our bodies. We stand taller and breathe more deeply in rooms with certain proportions, and crouch in others. Of course, none of this is new to the designer, but it nevertheless underscores the tactile or physiological nature of the built experience.

Recently gained knowledge of our emotional, visceral, and hormonal systems reinforces this understanding. Not too long ago, emotion was viewed as antithetical to "rational" cognition, a feeling arising from some mysterious place below, something to be tamped down in many instances. Today emotions are seen in a very different light as whole-body events, the endogenous kinesthetic activities of a living organism by which we experience the world. Maxime Sheets-Johnstone reports that "affective feeling and tactile-kinesthetic feelings are experientially intertwined"—that is, emotion and proprioception entail a "postural attitude" or "corporeal readiness to act in some way or another."[9] Giovanna Colombetti notes that all living systems are sense-making systems in which emotion pervades cognition through and through.[10]

The gist of this new perspective is that the designed environment, as every architect knows, is always an emotional or affective experience. Every room conveys a particular mood, and every place has its atmosphere. Sunlight streaming in from the Pantheon oculus, the sound of floorboards at Katsura, the scale of a Robert Adam room—all affect the designed experience, often in a dramatic way. Talented architects have always understood this predicate, but our urban environments speak otherwise. Buildings are more generally treated as aestheticized objects, and the city becomes the

random accumulation of these objects. The on-ground architectural experience, however, is often one of simple tedium.

There is also a third area of research today that is of interest to the designer, which is the recognition that we are profoundly social animals. And there is no greater failure of architectural theory over the past half-century than its inability to recognize this fact. Design should not be reduced to some silly semiotic game, in which the pedestrian must guess which item in their kitchen pantry the latest tall building best resembles. Biologists are beginning to fathom the grounding of our sympathetic resonances and intersubjective contagions with others. Evolutionary anthropologists are beginning to discern that human behaviors we formerly deemed to be cultural—music, dance, ornament, and the practice of design—are not cultural at all but behaviors rooted much further back in human evolution. Researchers now understand the critical windows in the formation of the social brain, and what environments facilitate or delay this crucial process. Sociologists are making the case that ritual and ceremony are not extraneous or learned skills, but something fundamental to the coding of the human genome. Rituals, gestures, and play (in its more intriguing sense) should similarly be placed at the center of the design process.

III. One Last Comment

It would not be right to close without commenting on William Morris's biophilia. The redeemed garden was, perhaps, the novel's deepest neuroscientific insight. He landed on something that is now well documented—a view of a meadow from a hospital bed quickens biological recovery, and regular contact with nature enhances the human immune system.[11] It also cuts the heart of "how" we live. Alvar Aalto once noted that "architecture, too, has an ulterior motive always lurking behind the corner, the idea of creating paradise. That is the only purpose of our buildings."[12] His plea can be taken literally. The word "paradise" derives from the Greek word *paradeisos,* related to the

Median *paridaeza,* which referred to an enclosed or walled off garden. The association of the garden with human happiness is universal. Will urban designers someday allow us this affordance—the figurative *niche* of our simple yet exquisitely crafted houses and workplaces scattered among whispering trees and odorous blossoms?

1. James Gibson, *The Ecological Approach to Visual Perception*, (Hillsdale, NJ: Lawrence Erlbaum Associates, 1986) p. 127.
2. Andy Clark, "An embodied cognitive science," *Trends in Cognitive Sciences* (September 1999), p.346.
3. James Gibson, The Ecological Approach to Visual Perception (note 1), p. 128
4. Martin Heidegger, "Building Dwelling Thinking," in *Poetry, Language, Thought*, trans. by Albert Hofstadter, Harper Colophon (New York), 1971, p.160.
5. Tim Ingold, *The Perception of the Environment: Essays on Livelihood, Dwelling and Skill*, Routledge (London), 2000, pp.178-87.
6. Evan Thompson and Francisco Varela, "Radical embodiment: neural dynamics and consciousness," *Trends in Cognitive Sciences*, October 2001, pp.424-25.
7. See Jan Gehl, *Cities for People* (Washington: Island Press, 2010).
8. Beatrice Sbiscia-Fioretti et al. "ERP Modulation during Observation of Abstract Paintings by Franz Kline," *PloS One*, 8(10): doi:10:1371/journal.pone.0075241.
9. See, for instance, Maxime Sheets-Johnstone, "Emotion and Movement: A Beginning Empirical-Phenomenological Analysis of their Relationship," *Journal of Consciousness Studies* (11-12), 1999.
10. Giovanna Colombetti, *The Feeling Body: Affective Science Meets the Enactive Mind*, MIT Press, (Cambridge, MA), 2014, p.63.
11. See my books *Architecture and Embodiment: The Implications of the New Sciences and Humanities for Design* (London: Routledge, 2013), pp.73-76; and *From Object to Experience:*

The New Culture of Architectural Design (London: Bloomsbury Visual Arts, 2018), pp.123-125.

12. Alvar Aalto, "The Architect's Dream of Paradise," (1957), in Göran Schildt, *Alvar Aalto in His Own Words*, Otava Publishing (Helsinki), p.215.