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INTRODUCTION

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This special issue on the theme of "agency and (the built) environment", explores correlations between livings systems and their environment. It therefore considers how built environments are formed, the correlations between environment and builder/inhabitant and how, as designers, we might rethink humans' and other organisms' relation to environment and, in so doing, reapproach how humans define and form our built environments.

The coupling of organism and environment as theorised by the Estonian proto-semiotic biologist Jakob von Uexküll (1864–1944) is a keystone. Uexküll influenced key architectural thinkers of the twentieth century (Botar 2001 and Detlef 2007). His sign-oriented and functional notion of space (Uexküll 1926) is crucial in any biosemiotic consideration of 'environment'. In particular, he foregrounds the way in which signs may be understood as forces which inform and direct an organism's engagement with its environment. This is a conception in which architecture, or the forming of a built environment is, at base, the moulding of "forces" to direct life in a desired direction (Kiesler 1939). A sign *informs*. Whether signs announce anything directly or indirectly, they nevertheless orient their interpreter; in this sense, signs may be compared to "force". Given that all organisms persist to satisfy their physiological and social well-being, perception correlates to activity: i.e. observation of some quality in the world leads to some effect, which affects some action. The context in which X is interpreted defines Y, which leads to a response Z,being the synthesis of X and Y in a particular context. The events and relations affecting an agent become genuinely meaningful to the agent as a result of their placement in a larger system of communicative interactions, understanding the effect on the percipient as denoting merely a situated response (Favareau 2007).

The manner in which something holds significance for some other, such as to effect a force, is intrinsic to agency. That there is some effect, between one thing and another, means that the perceiving organism and the "object" of attention enter into a relationship and have some form of commonality. The fact that it is the property of significance that brings this relation into being distinguishes this kind of semiotic causation from mere brute force causation (see Hoffmeyer 2007) and forms the hallmark of relationships established by living beings - with one another and their environment. We might consider that the effect has some value or that it is self-reinforcing, such that it causes habit – or an inclination to respond in some way. These *vectors of significance* constitute the organism's environment, establishing a form of force field within which organisms live their lives (See Lewin 1935 and *cf.,* Lotman 2005). Agency thus infers some effect generated by mutually constitutive intersecting vectors of significance and that this effect is reinforcing.

Living systems are embedded in their environment, which, from the organism's perspective, is a matter of relations and forms established through vectors of significance. These vectors of

significance constitute environmental pressures and form an organism's "life space" or, as it is sometimes called, an organism's niche. Hoffmeyer's work, in particular, has been important to establishing what constitutes a *niche*, especially the "semiotic niche" (2008: 169-211 1996: 59-60). Tracing the idea from its origins in the early to mid-twentieth century, through Grinnell's, Elton's and Hutchinson's definitions, Hoffmeyer shows that biological conceptions of 'niche' have tended to harbour the idea that there is inevitable "*competitive exclusion*" (2008: 184; italics in original) through natural selection which determines the nature of the niche for the species inhabiting it. Yet, as Hoffmeyer (2008: 184) points out, the ecological niche is "n-dimensional", so it is difficult to work out whether a niche fits two species in exactly the same way. What is needed, in light of this, is a sense of how the species apprehends and inhabits a niche; or, put another way, what the species discerns in the niche. Hence, the semiotic niche:

> The idea behind the concept of the semiotic niche was to construct a term that would embrace the totality of signs or cues in the surroundings of an organism – signs that it must be able to meaningfully interpret to ensure its survival and welfare. The semiotic niche contains all of the traditional ecological niche factors, but now the semiotic dimension of these factors is also strongly emphasized. The organism must *distinguish* relevant from irrelevant food items and threats, for example, and it must *identify* the necessary markers of the biotic and abiotic resources it needs: water, shelter, nest-building materials, mating partners, etc. The semiotic niche thus comprises all the *interpretive challenges* that the ecological niche forces upon a species (Hoffmeyer 2008: 184; italics in original).

What the semiotic niche entails, then, is agency – in the "interpretive challenges" in which species engage. Even as a species is 'forced' by signs in its environment, it is engaged in succumbing to the force of some signs available for interpretation according to its sensorium and not others available for interpretation according to its sensorium (as well as, sometimes being subject to signs that are *not* available for interpretation according to its sensorium, such as those associated with non-customary predators).

The spatial constraints on species that are characteristic of a niche amount to a fundamental feature of living systems in their development and unfolding engagement with the world. The "interpretive challenges" species face and the subsequent configurations that arise from enactment of specific options precipitate specific engagement with, and even a shaping of, the species' environment. Evident in reaction-diffusion systems and birds flocking, the components spanning systems and scales from living system to social system have relevance and their interactions are deictic, effecting meaning and direction to form structure and patterning because the relations constrain one another. This is evident, for example, in the building of self-ventilating mounds in termites: the rules that govern construction can be seen as productive constraints, because they are sensed by the organism that responds to them, giving them what we will call, for want of a better word, a 'meaning', and ultimately creating a functional pattern (the mound and its passive ventilation) that improves the colony's fitness. It is a fundamental character of natural systems that spans scales from abiotic to social systems and does so with an emphasis on *system* and collective action.

Developing this last idea, two lesser known papers of Hoffmeyer also form provocations for this special issue: (1) his 1995 paper, 'The swarming cyberspace of the body' and (2) 'The Swarming Body' (1994). Both consider endosemiosis as undermining unitary, self-identical theories of organisms, all the way up to humans, as repositories of moored consciousness or stable cogitos. Both present a collective/social conception of organisation effected through semiotic interactions, to inform a notion of space and (built) environment as self-organising. This semiotic perspective unifies the (built) environment and biology and is the basis of this special issue in which the contributing

authors offer an interdisciplinary perspective on agency in the (built) environment and on how space is a scaffold through which organisms form correspondence with what they perceive.

Overview of Articles Included in this Special Issue

This special issue includes a diverse range of invited papers by authors predominantly fresh to the biosemiotics fold. The purpose, as such, is to incorporate new insights and contemporaneous dialogue, opening debate on the issue of agency in the (built) environment and extending biosemiotic notions of agency (viz. Tønnessen 2015) and pragmatically to notions of how we inhabit and shape environments, as well as the impact all of the foregoing have beyond the human sphere.

The first paper, by Bellentani and Arhipova, appraises a biosemiotic approach, emphasising how social media impacts the use and representation of built environment. In so doing, the paper proposes semiosic dimensions of agency. Bellentani and Arhipova suggest that human beings, like any meaning-making system, actively communicate experience and that the ubiquitous impact of digital media on contemporary urban living provides a means of insight into the recording and amplification of built environment interactions. Biosemiotics, they claim, can prove a useful perspective for interrogating the axiological dimensions people harbour with respect ti their environments. Biosemiotics, importantly, provides a lens through which to scrutinise the agential occupant-environment relationship because of its treatment of natural and built environments as equal, helping urban managers to move beyond the archaic divide between nature and human built forms to provide a means to reconsider human/non-human relations for a more ecologically oriented built environment. In so doing they propose how digital media becomes built environment, extending human *Umwelten* as opposed to merely allowing contemporary representations of it. They clinch the point that social media practices around nature and the built environment do not just amount to some further representations which furnish the *Umwelt* but, instead, add up to a furthering of the *Umwelt* in some way – perhaps by changing users' relation or conception to the (built) environment. The idea leads to consideration as to how digital social media emphasis and augment social space(s). Henri Lefebvre emphasised the role of social space, and prompted a revision of how space is perceived with regards to the built environment and the modern architecture movement (Lefebvre 1995). He exposed a juxtaposition between the idea of abstract space (which is at once, homogenous and fragmented, geometric, visual and phallic) and space as an extension of the body, sensorial and imaginative. As Stanek says "Lefebvre formulated a concept of space as socially produced and productive: proposed by and made productive in a variety of practices and by various agents that cooperate, compete and struggle" (Stanek 2012:50). Lefebvre concluded that space is a once produced and productive. Extending the idea digitally presents the idea that digital space (if we can claim such a thing) influences and is revising social space, and that digital social media is the "glue" driving this shift. Lefebvre was dead against semiotics (he only knew Saussure's semiology). Observing social media practices through a biosemiotics lens, Bellentani and Arhipova provide a commentary on social space prompting augmentation of the *Umwelten* theory and how digital mutli-media practices are reinventing our relationship with built environments.

Toeing the line between biosemiotics and anthropology, Machtyl's article draws parallels between these seemingly disparate fields, and emphasises the juxtaposition between them to be a misnomer when deliberated in terms of dwelling and living. Highlighting the significance of non-human agency and design she pulls Ingold into line, explicating his antipathy to semiotics to illustrate a fresh perspective on Gibsonian ecology. Reassessing Ingold's criticism of semiotics - the assumption of continuity of semiosis in the world – posing his claims as revealing an asset as opposed to a vice, Machtyl emphasises the coexistence of all beings in the world. This is not only a virtue but a necessary understanding in light of environmental catastrophe awaiting us should we continue

down the road paved by the antiquated anthropocentric view. Throwing light onto Ingold's premise of living *in* the world, she explicates Ingold through a Peircean lens, pointing out convergences between Ingold's perspective and the biosemiotic project. Following Maran's (2016) subject-oriented perspective, Machtyl investigates *Umwelten networks* using a case study (Zoepolis) through which she explores the subjectivity of cohabitating agents and how this might inform an ecological design perspective. In so doing, Machtyl sets the ground for successive authors, touching on notions of "intentionality" (a matter Seif tackles in his paper concerning *De-Sign*), and the contribution by Benedikt, following Machtyl's, which introduces Martin Buber's concept "I/It-I/You".

Michael Benedikt is an architect, who makes no apology for explicating a non-biosemiotic perspective, but in so doing endeavours to explicate parallels between a collection of matters of convergence between architectural theory and biosemiotics. One of these is the *Isovist* theory of which Benedikt is an originator. An isovist is a method of representing the spatial richness of visual perception graphically. Such methods illustrate the visual structure of built environments and demonstrate how buildings are composed in order to address the directionality and temporality of vision: they are apprehended gradually as isovists change and shift as we navigate and move through an environment (Benedikt 1979). Coupled with a Gibsonian ecological perspective of dwelling and spatial perception, Benedikt presents a critique of overtly system perspectives which he tempers through the lens of Martin Buber's social "I/It-I/You"theory. This latter, he suggests, is a way out of the typical overt systems assessment, providing a means to describe (the meaning of) objects and space phenomenologically and ecologically at once.

Stimulated by "The Swarming Body" (Hoffmeyer 1997), one of this SI's two provocation papers, Bacigalupi explores the idea that agency is not individual or localizable but a product of interlacing and overlapping patterns of inference. As a collective phenomenon, agency is identified analogically as a swarm of swarms, or overlapping swarms, corresponding to body composition, whereby functionality and maintenance of any "organisation" is deemed a consequence of mediation, signification and collaboration between discrete yet conjugal collectives; or "parts". Exploring the process of inchoate sign generation (or semiogenesis), Bacigalupi presents a heuristic lens through which complex generative agential phenomena might be rigorously understood. Using the termite mound as a prototypical example of collective sign action and how this manifests an artefact that is a physiological extension of the colony - and thereby a semiotic component of the termite - Bacigalupi demonstrates points of convergence between termites and humans. These, he claims, provide greater efficacy and a means of forming a more balanced approach to co-creation in design. As such, they would lead to the production of built environments that are more auspiciously situated and, so, in tune with the multifarious web of agencies human incursions into the fabric of being and becoming tend to evince.

The final paper from Seif extends the concept of "intentionality", introduced by Machtyl, to argue the potential for design to promote transdisciplinary trajectories, in the same way that Bacigalupi prompts through his conceptual heuristic model. The idea of *De-Sign* is at the heart of this contribution. It emphasises the intrinsic correspondence design possesses, as an activity and act of mentation, in common with all sign-action or, more precisely, semiosis. Design is thus a process of semiosis – a fusion - that translates and transforms an environment for functional, aesthetic and artistic purposes. Like the contributions that precede his, Seif illustrates how semiosis is a product of agency and how this process, perceived through a (bio)semiotic lens, ought to inform an ecological and more harmonic approach to (human) world-making.

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