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Poiesis, Ecology, and Embodied Cognition

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Abstract

Since René Descartes famously separated the concepts of body and mind in the 17th century, Western philosophy and theory have struggled to conceptualize the interconnectedness of minds, bodies, environments, and cultures. While environmental psychology and the cognitive sciences have shown that spatial perception is 'embodied' and depends on the aforementioned concepts' interconnectedness, architectural design practice, for example, has rarely incorporated these insights. The paper presents research on the epistemological foundations that frame the communication between design theory and practice and juxtaposes it with scientific research on embodied experience. It further suggests that Asian aesthetics, with its long history in conceiving relations and art as interactive, could create a bridge between recent scientific insights and design practice. The paper links Asian aesthetics to a discourse on ecologies in the post-Anthropocene, in dialogue with contemporary conceptions of time. It outlines an approach to the interconnectedness of minds, bodies, environments, the sciences, and cultures, in favour of a future that is governed by creative wisdom rather than 'smart' efficiency.

Keywords: poetics, poiesis, ecology, embodied cognition, second-order cybernetics, China

Poiesis

At morning there are flowers to cut the heart,
And evening drives them on the eastward-flowing waters.
Petals are on the gone waters and on the going,
And on the back-swirling eddies,
But today's men are not the men of the old days,
Though they hang in the same way over the bridge-rail.¹

(Li and Pound, 1915: 14)

Time has passed since Ezra Pound penned the lines above – more than a century. Even more time has passed since the words were written in the original Chinese by Li Bai in the first half of the 8th century, Tang dynasty. Still, flowers bloom, petals fall and decorate the waters here and there. Are they the petals of the old days? Whose old days? Humans rarely hang over bridge rails to watch the flow of time. Most petals pass unnoticed. Time is not nature's time

¹ Excerpt from *Poem by the Bridge at Ten-Shin* by Li Bai (701–762) also known as Li Bo, Li Po and Rihaku, translated by Ezra Pound and published in Cathey, 1915: 14. The poem is no. 18 in the Gu Feng (In the Old Manner) collection of poems by Li Bai. Scholars have had difficulties to date the poems by Li Bai (see Watson, 1971: 144); thus no exact date for the poem can be given.

anymore – time of the old days and the sublime, distant but modest time.² The time of the Anthropocene is technology's time.

In the 1968 movie *2001: A Space Odyssey*, in one of the most memorable scenes of the film, director Stanley Kubrick tells us that the dawn of man occurred with the discovery of tools (Kubrick and Clarke, 1968). The capacity to think objects as tools, specifically to defend and to attack, marks the beginning of technological invention and the transition from ape to human – and it is, according to Kubrick, just one step away from deserting from Earth into space.

An image of harsh nature is presented to the audience. The landscape is desert-like. There is sand, some rocks, only a few shrubs, a puddle of muddy water, a group of apes and some tapirs. A leopard appears on the scene and kills an ape. None of the other apes interfere. They run away. The apes fight with another group of apes over the water, and lose. This is the struggle of daily life. Another day. The night has made an object emerge on the scene that is perfect in its geometric form, extra-terrestrial in its appearance, a black monolith. It is not clear what it is. On this very same day, one of the apes discovers that he could use the bone of a tapir's carcass as a tool to attack and to destroy. On a subsequent day, these apes are able to win the battle over the water against the other group of apes. They kill the leader of the other group using bones as weapons. Time for celebration. A bone is thrown into the blue sky – cut – a spaceship, black sky all around it, infinite space. We hear Johann Strauss' waltz "The Blue Danube"³.

The Dawn of Man scene reflects Darwinian theories of evolution. The focus on struggle, competition, and death as part of evolution is in line with the emphasis made by Darwinists. And yet, the scene does not simply present evolution as a biological process. The scene suggests that evolution is a process, in which the socio-cultural is intertwined with the biological. The scene does not claim to recount scientific or historical fact. It is decidedly marked as myth. Only after the black monolith appeared on the scene, does one of the apes discover the possibility to use the bone as a tool. Of course, this is a known pattern. The interference of divine forces on Earth and the transference of knowledge and skills from divine to human beings, assisting the latter with the control of their environment, is a common theme in ancient myths. We find it in the writings of Homer, Hesiod and Ovid but also in the ancient myths of China (Boardman, 1996; Birrell, 1999). The myth of the titan Prometheus stealing fire from Zeus and passing it on to the humans living on the Earth is a prominent – and much recited – example from the Western canon.

² Unlike the beautiful, the sublime arouses sensations of awe and respect through an encounter with the uncontrollably vast and unmeasurable (see Kant, 1987: 97-101; see Hegel, 1920:85-86).

³ Original title *An der schönen blauen Donau*, composed in 1866.



Figure 01: Prometheus, who had been punished by Zeus, is freed by Heracles. Scene depicted on black-figured cup made in Athens, ca. 500 BCE. Part of the collection of the Louvre. Image rights: public domain.

Subsequently, living on Earth becomes a drama. Zeus does not only punish Prometheus but the human population as well. Technological progress, the myth tells us, does not come without cost. While there might have been earlier versions of the Prometheus myth, the earliest version that has survived is in the writings of Hesiod. Hesiod lived most likely between the end of the 8th and the middle of the 7th century BCE (Hesiod and Most, 2006).

In associating progress with violence, the *Dawn of Man* scene mirrors the view of the ancient Prometheus myth. However, it goes beyond ancient myths by suggesting that technological progress has an impact on the biology of living beings. As we see from Li Bai's poem quoted at the beginning of this paper, the question whether the men of today are still the same as those of the old days has been lingering for some time. Whether Li Bai implied that biological change had occurred in those 'men' is questionable. While we cannot know precisely what Li Bai thought, we do know that ancient Chinese as well as pre-Socratic Western traditions saw spirits and nature connected (Tucker, 2014; Heidel, 1910).

Embodied Cognition

The first scientific investigations into an understanding of the inter-connectedness of nature, society and culture were made by the biologist and zoologist Johann von Uexküll at the beginning of the 20th century (Uexküll, 2014) (Uexküll, 1926). One of the founders of ecology, von Uexküll's most notable contribution to the history of ideas is the concept of *Umwelt*⁴. An environment receives living beings as objects. An *Umwelt*, in contrast, is constructed by living beings. Influenced by the philosophy of Immanuel Kant, von Uexküll transferred the insights on subjective perception into the world of non-human living beings. A living creature is always also *Umwelt*. The limits of its *Umwelt* are not made by the limits of the living creature's surface (skin), but by its perception and its action, the latter of which is defined by its movements in both time and space. According to von Uexküll, each living creature has its own subjective time and space. In fact, von Uexküll suggests that the idea of

⁴Contemporary literature in the English language tends to use the German term *Umwelt*, in plural *Umwelten*, when speaking of Uexküllian concrete living environments to avoid confusion. Specifically, *Umwelt* should not be confused with the term *lifeworld* (*Lebenswelt*), which indicates a concept defined by Edmund Husserl. The two are distinctly different concepts.

one objective world is pure fiction that is maintained because it comforts us in letting us believe that the communication between human beings is a straight forward process that we do not need to think about (Uexküll, 1956, p. 46, 167).

Johann von Uexküll is critical of Darwinism, less so of Darwin himself and his theory of evolution, more so of the interpretations, emphases, and theories of the Darwinists that succeeded Darwin. His crucial point of critique is philosophical. He considers Darwinism materialism in disguise, a primarily mechanistic world view that strips living beings from purposiveness (Uexküll, 1907, p. 643). Jakob von Uexküll – against Darwinism – highlights that living beings cannot be conceptualized as disconnected from their concrete living environments (*Umwelten*). He emphasises that every being is made by and makes its *Umwelt*. The model is anti-mechanistic. It carries notions of circular causality. The function-circle shown in figure 2 presents von Uexküll’s model of a living being interconnected with its *Umwelt* in a simple diagram.

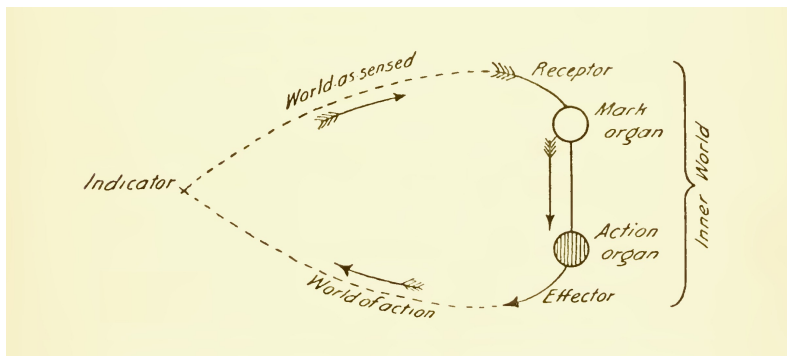


Figure 02: Johann von Uexküll’s Function-Circle. Simple diagram describing the interconnectedness of a living creature and its *Umwelt*. From *Theoretical Biology* (Uexküll, 1926: 155). Image rights: public domain.

As the diagram shows, the inner world is divided into two parts; one, which receives the impressions, is turned towards the world-as-sensed, and the other, which distributes the effects, is turned towards the world of action. Between mark-organ and action-organ lies the watershed of the whole function-circle. The mark-organ and the action-organ are each of them controlled by a rule; the one arranges the impressions in the mark-organ, and so creates the indications.

(Uexküll, 1926, p. 155)

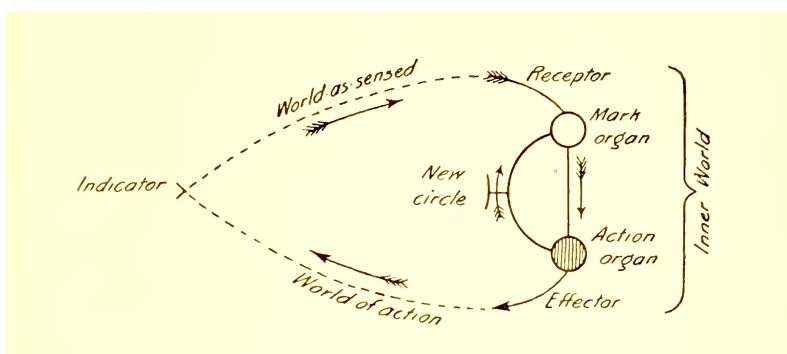


Figure 03: Johann von Uexküll's Function-Circle. Diagram with inner circle describing the interconnectedness of a living creature and its Umwelt. From *Theoretical Biology* (Uexküll, 1926: 157). Image rights: public domain.

A new circle is introduced within the animal's own central organ, for the support of the external function-circle, and this connects the action-organ with the mark-organ. In this way, the animal's own action-rule fits in with the indications stimulated from without, and now serves the mark-rule as a skeleton to which it may attach the external indications.

(Uexküll, 1926: 157)

Uexküll's research became the basis for the work of Humberto Maturana on the *Biology of Cognition* (Maturana, 1980), and subsequently for the research by Maturana and Varela, conceptualising living beings as autopoietic systems, i.e., as autonomous, self-referring and self-constructing systems, however always in exchange with their environments (Maturana and Varela, 1980). Notably, von Uexküll's ideas influenced not only biologists and ecologists, but also philosophers with as diverse points of view as Martin Heidegger and Gilles Deleuze, and significant poets, such as Rainer Maria Rilke. The Italian philosopher Giorgio Agamben suggests that the Uexküllian investigations are commensurate with contemporary quantum physics and the artistic avantgardes, setting the path for the "unreserved abandonment of every anthropocentric perspective in the life sciences and the radical de-humanization of the image of nature" (Agamben, 2004: 39).

The question of a higher or lower degree of perfection in living beings can only be asked if the researcher considers the world that surrounds him to be the universe that surrounds all living beings like him and to which they are more or less well adapted, as appearance teaches. From this point of view, the human world is considered to be the only authoritative one and, consequently, the blueprints of the lower animals appear inferior to the blueprints of the higher animals and, in particular, of man⁵.

(Uexküll, 2014: 22)

Nevertheless, the radicality of von Uexküll's approach, his concerns and his critique of the Darwinian shift towards a mechanistic understanding of life might be fully understood only when re-visiting recent scientific and cultural developments.

⁵ Translation from German by the author.



Figure 04: Blue Marble, photo of the Earth taken on December 7, 1972, by the crew of the Apollo 17 spacecraft en route to the Moon at a distance of about 29,000 kilometres (18,000 mi). Image credit: NASA, public domain.

In 1969, one year after *2001: A Space Odyssey* was released, the media-connected world witnessed the first landing on the moon. Images of an alien – not particularly homely – world reached the Earth’s population. The universe opened up with these images from the moon. A new sense of power emerged. Yet, a photograph that was taken three years later, in 1972, on the Apollo 17 flight had possibly an even higher impact on how people perceive life on the Earth. On December 7, 1972, the astronauts of the Apollo 17 crew were able to take the first picture of the planet Earth that showed it as a perfect globe, i.e., without shadow. The image is entitled Blue Marble (Reinert, 2011).

With this image, which ranks highly among the photographs most often reproduced, a shift in point of view is initiated. We look at the Earth from space and from the distance see a perfect sphere, the globe. The view from space is like the bird-eye view in design – one could also speak of a god’s view. It is, in any case, a view that is detached from the experience of everyday life. It assists rationalisation but also radical simplification with the focus of research shifting to the analysis of movement. Only two years after the Blue Marble image was released, Stafford Beer in writing *Designing Freedom* wonders whether “the whole apparatus of our civilization actually works any longer. Is it beginning to fail?” He further points out that there is plentiful evidence fuelling the suspicion that it might not be the case.

I instance the decay of previously rich and healthy cities from the centre outwards, creating ghettos and all the social frightfulness that goes with them, stark inequalities, private penury, social squalor, a rise in crime, a rise in violence. I instance pollution on a world-wide scale: the poisoning of the atmosphere, of seas and lakes and rivers.

(Beer, 1974: 2)

Public consciousness of the problems that humanity had manoeuvred itself into was only temporary, however, and was not met with broader action. Images, such as the Blue Marble photograph of the Earth in infinite space, contributed to a sense of human omnipotence that

minimized the significance of experiential time. The image of the Blue Marble – in all its beauty – is a perfect reflection of narcissist admiration, and as such the ideal image for the contemporary Darwinist who still considers competition more important than mutual aid and coexistence.

We know today that the activities of human beings have gradually grown “into a significant geological, morphological force” (Crutzen and Stoermer, 2000: 17). As we have seen above, the insight is not new. It had gained more extensive attention, however, only in the past decade when popular media began to publicize the debate that had emerged among scientists around the term Anthropocene and the related concept. It is an insight, of course, that would fill the narcissist in us with pride if it were not at the same time so scary, as – all narcissism aside – it seems it is more difficult to reach other planets than it appeared several decades ago.

In their influential article *The “Anthropocene”*, published in the IGBP Newsletter no. 41 in May 2000, Paul J. Crutzen and Eugene F. Stoermer suggested that there is sufficient scientific evidence that human activities have so significantly altered planet Earth that one should consider the changes within the context of a new epoch – the Anthropocene. It should be mentioned, however, that there had been earlier publications seriously considering the impact of human life on the planet Earth. Crutzen and Stoermer specifically highlighted the work by Antonio Stoppani and by George Perkins Marsh from the second half of the 19th century (Crutzen and Stoermer, 2000: 17). The term Anthropocene, it should also be mentioned, had been used by Eugene F. Stoermer already in the 1980s but it did not gain more extensive attention then.

While the fact that the debate around the environmental issues, endangering life on Earth, has recently regained significant attention might mark a new beginning, it should be taken into account that the image that the debate revolves around is still the one from 50 years ago. It is a narcissist's image that rejects the multiplicity of worlds and establishes coexistence from a playmaker's point of view. The view of the analyst is from above. The focus of the analysis is on dynamics that have at their basis a homogenous time that is not the time of experience -- it is disembodied time, unlike Uexküllian time.

The 'globe' view – as researchers, such as Donna Haraway, Anna Tsing and Kenneth Olwig, have highlighted – is misleading (Haraway et al., 2016). Haraway's statement on the relevance of what the ideas are that you "think other ideas with" should be highlighted as well in this context. It is relevant.

It matters what ideas you use to think other ideas with. It seems like a very simple thing to say. It especially matters what-ideas- you-use-to-think-other-ideas-with if one of them is not in control of the other, if they reach into and interrupt each other, if the result of using ideas-to-do-ideas-with destabilizes both in ways that change the name of the game for the possibility of ongoingness, accountable to the power structures of the encounters and the entanglements.

(Haraway, 2013: n.pag.)

Ecology and Time

Ecological thinking, beyond the media mainstream, considers entities in their capacity to live in environments, but it is not only concerned with biological life. It is concerned with thinking oppressions, and exclusions, and likewise inclusions – in time and space. It emphasises the thinking of relations. Ecological thinking is thus also concerned with the survival of cultures, societies, communities, and places. Within this context, we can also

speak of ecologies of art or ecologies of design. If we do so, we indicate an emphasis on relational thinking, but not necessarily a thematic focus on what is generally considered natural, such as trees, or water. The common idea of ecology as restoration of the natural, as Timothy Morton has also emphasised (Morton, 2007; Morton, 2010), is to be put aside. There is no authentic or original nature to which we can return. If there were any such nature, it would certainly not be able to sustain the living standards of today's populations, nor could it promise this living standard to any of those who do not yet live a life without hunger. Again, we do not enter entirely new thinking. The philosopher Alfred North Whitehead formulated similar ideas already 100 years ago. In the book *The Concept of Nature*, first published in 1920, Whitehead writes:

For natural philosophy everything perceived is in nature. We may not pick and choose. For us the red glow of the sunset should be as much part of nature as are the molecules and electric waves by which men of science would explain the phenomenon. It is for natural philosophy to analyse how these various elements of nature are connected.

(Whitehead, 1920: 29)

Ecological thinking is not neutral. On the contrary, it encourages the debate of what kind of world we would want to live in. Within this debate, art could play a pivotal role in making potential connections and possible worlds present – worlds to be experienced and to interact with. And while we might not want to return to a distant imaginative past of a natural nature, we might want to orient ourselves. We could turn elsewhere to see whether there have been other ways of thinking that managed to escape the pitfalls of Western categorization that makes thinking in relations so difficult. Within Confucian and neo-Confucian thought, for example, the macro- and micro-worlds have always been connected, constituting an "anthropocosmic" rather than an anthropocentric worldview (Tucker, 2014: 143).

We could learn both from Asian philosophy and art. We could learn from the dynamics of Chinese painting, its thinking of space and time as one, its knowledge of the "in between" as mediator between opposites, and from its thinking in various distances rather than in linear perspective (Westermann, 2019; Westermann, 2018; Jullien, 2018). The re-formulation of conceptions of time is of fundamental importance in this context. The depth of time, connected to a multiplicity of spaces, that has been oppressed by the ubiquitous pair of labour and fun, needs to be recreated (see Han, 2017). At last, one could reiterate Roy Ascott's hope for a new art:

[W]e can hope for the emergence of a radically constructive art, moving from the older frame of time and representation to the multiple and layered frames of parallel time-worlds, creating the ceaselessly bifurcating semantic pathways of virtuality and simulation.

(Ascott, 2003: 231)

The German philosopher Peter Sloterdijk recently highlighted the need for a new anthropo-technology that uses the metaphor of "a dialogue with nature" as a guiding principle – a technology that is "characterized by cooperation rather than by domination, even in asymmetrical relationships" (Sloterdijk, 2014: 16).

Art and design would be meaningless if they did not accept the task of creating this technology for which the precise term would be anthropo-cosmo-technology.

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