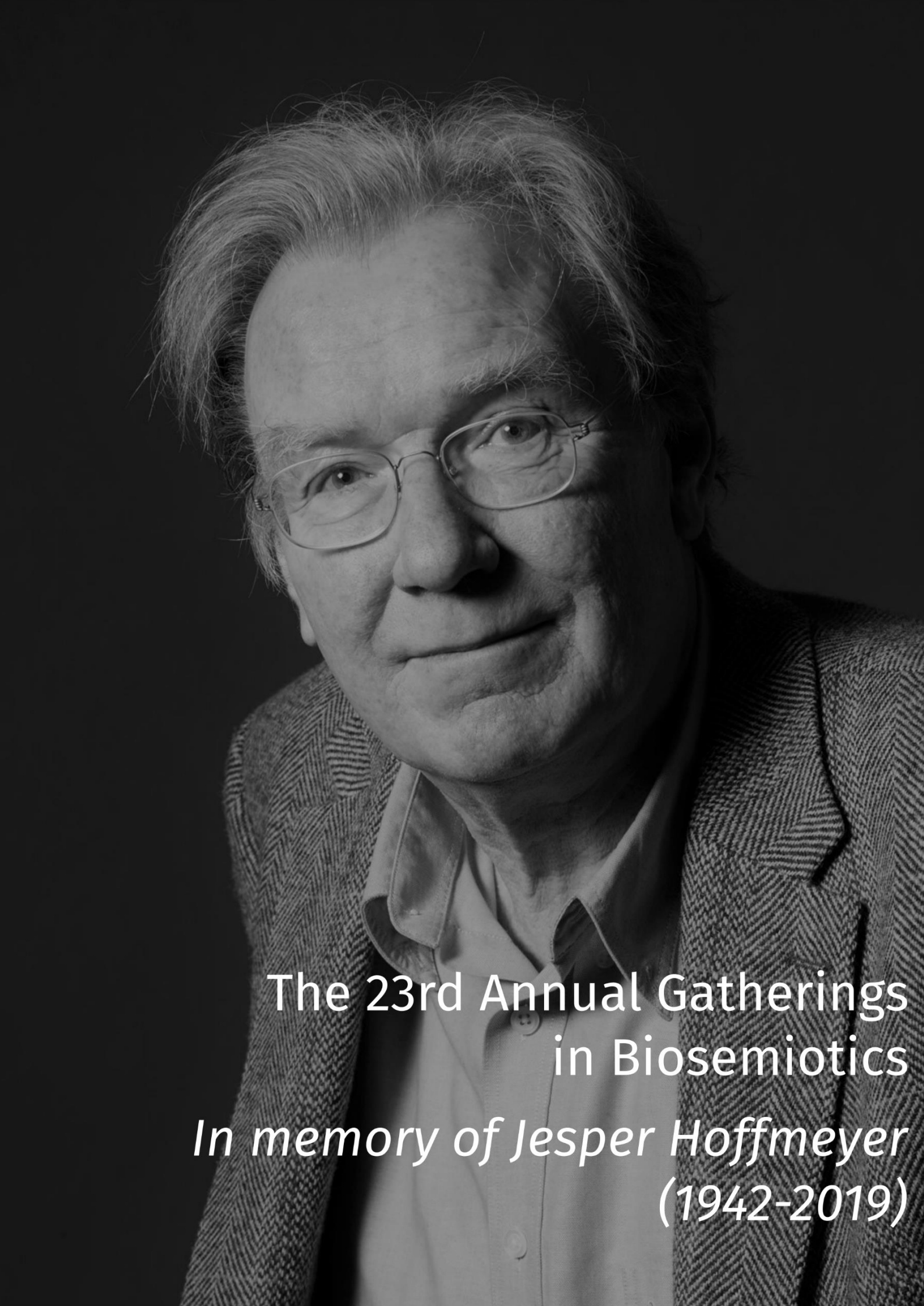

The 23rd Annual Gatherings in Biosemiotics

In memory of Jesper Hoffmeyer (1942-2019)

Booklet produced in 2023 by the
International Society for Biosemiotic Studies.

XXIII gatherings in BIOSEMIOTICS

Copenhagen, Denmark
31 July - 4 August

Celebrating the life and work of Jesper Hoffmeyer, biologist, biosemiotician and friend.

THE INTERNATIONAL SOCIETY FOR BIOSEMIOTICS STUDIES

UNIVERSITY OF COPENHAGEN

Gatherings in Biosemiotics 2023

	Monday 31	Tuesday 1	Wednesday 2	Thursday 3	Friday 4
	Morning chairs				
	K. Kull	***P. Cobley***	***C. Emmeche***	***Y. Denizhan***	
10:00-10:30	Opening remarks (9:40-10:00) Favareau	Kull	Cobley	Sharov	
10:30-11:00	Deshusses	Machtyl	Cole	Yudanin	
11:00-11:30	Pelkey	Ferreira	Ongstad	Yu	
	coffee break				
12:00-12:30	Mayer-Foulkes	Miyamoto	Stjernfelt	Zhou & Sun	
12:30-13:00	McTeigue	Guddemi	Zubek & Rączaszek-Leonardi	Kusters	
	lunch				
	Afternoon chairs				
	D. Favareau	***F. Stjernfelt***	***V. Alexander***	***A. Sharov***	
14:30-15:00	Denizhan & Karatay	Bennett	Khumalo & Stepp	Schumann	
15:00-15:30	Bacigalupi	Lacková	Vehkavaara	Giampietro	
15:30-16:00	Alexander	Lang	Pickering	Ireland	
	coffee break				
16:30-17:00	Rodríguez	Méndez & Castro	Tønnessen	Olteanu	
17:00-17:30	Han	Rodrigues-Vitti, Emmeche, Nielsen	Zengiaro	Delahaye	
17:30-18:00	Van Walsum	Cerizza	Turovski	Rattasepp	
18:00-18:30	Hendlin & Kamp	Ilyin	**Journal board meeting 18:15-19:45**	**Closing remarks Biosemiotic achievement award 18:00** **Conference dinner 19:00-22:00**	

Jesper Hoffmeyer Memorial Celebration Day

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Jesper Hoffmeyer Memorial Celebration Day

In 2019, shortly after the death of our dear friend and colleague, Jesper Hoffmeyer, a number of us began making plans for a Memorial Conference in his honour to take place the following spring at the University of Copenhagen. The arrival of the COVID pandemic in March of that year put an end to that plan, as international travel was shut down for many countries until late last year.

This year, to our great delight, we members of the International Society for Biosemiotics Studies were granted permission to hold our 23rd Annual Gatherings in Biosemiotics in the exact same room where we held our very first Gatherings in 2001.

"Biosemiotics has no beginning" Kalevi Kull reminds us often, but like all organic processes, one can trace major inflection points in its development, with the publication of Jesper Hoffmeyer's English language edition of *Signs of Meaning in the Universe* in 1996, certainly qualifying as one of them, and the first annual *Gatherings in Biosemiotics,* organized by Jesper, Kalevi and Claus Emmeche and held right here where we meet again this year, qualifying as another one.

It is fitting, then that we devote the last day of our conference to the man who, through his writings, allowed so many of us to find each other as intellectual kindred spirits, and to build together this uniquely far-seeing community of scholars and friends. And yet, as his colleagues once wrote of Jesper's often ambivalent feelings towards academia: "Notwithstanding these activities, a whole life devoted completely to teaching, writing and scholarship would seem like a desert to him" (2002:43).

Accordingly, on the last day of our Gathering, academic colleagues, family, and friends come together (both live and via video) to celebrate the life and legacy of Jesper Hoffmeyer, not just as the renowned scholar and public intellectual that he was, but also the many non-academic aspects of this remarkable man – as a friend, family member, schoolmate, saxophonist, newspaper columnist, artistic inspiration, jazz fan, 1960s commune co-habitant, and so much more.

Jesper touched the lives of many, leaving behind a legacy that extends far beyond his pioneering research. On Friday, August 4, 2023, we will gather to celebrate with beer and laughter this brilliant and convivial man.

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The Creativity of Cells: Aneural Irrational Cognition

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Baluška and Levin's (2016) review of the literature on aneural cognition in single-celled organisms, plants, and animal tissues is focused on what might be called *rational* biological processes, using inherited or habituated signal pathways. The authors do not touch upon the extent to which simple organisms and cells are capable of *irrational* cognition. Human memory is not always the result of conditioning that locks in the most statistically relevant information about the environment.

Techniques for memorization available to humans use rhyme, rhythm, tone and other poetic devices, such as metaphor, metonymy, and symbolism. The mind-palace technique forms memories via arbitrary association and does not require multiple repetitions as straight rote learning does. People with synesthesia are better able to recall arbitrary facts because numbers or letters may have for them a unique color, texture or shape. Synesthesia studies have contributed to an understanding of how the subconscious works in a cross-modal manner. These types of memory formation do not conform to what we may think of as typical logical operations.

I will argue that certain conscious mnemonic devices may have evolved from aneural semiosic mechanisms. The physical properties of sign-vehicles in signal pathways—insofar as they may be coincidentally similar to or coincidentally proximate to, or arbitrarily connected to a component of the pathway—may lead to radical change in the function of the pathway. The self-organized emergent patterns that result from such lower-level "poetic" flexibility may be more robust and more efficient than patterns that require precisely determined categorically-correct local interactions. Such processes would flow easily to the lowest energy state. These aesthetic processes may underlie the most significant evolutionary adaptations, as well as what might be called learning by insight or having an epiphany.

The code duality model of Emmeche and Hoffmeyer (1991) can account for the apparently paradoxical situation wherein the physicality that grounds sign relations can also provide the physical qualities by which new (sometimes irrational) relationships can begin to form. As the effects of local sign-readings interact in the process of self-organization, these qualities provide the constraints that engender semiotic freedom, as well as the forgiving imprecision that leads to regularity.

I will illustrate local sign "misreadings" with examples of laboratory manipulations of pea plants that cause them to pursue wind as an index sign of light, virus conformations that "trick" the body with molecular mimicry, and the use of a conjugate to encrypt self with non-self leading to an autoimmune reaction. In these cases, the normal pathway is not simply broken or blocked, it is co-opted. Thus, it becomes possible to see how novel evolutionary adaptations might use similar aesthetic mechanisms to repurpose existing pathways.

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Semiosic Agency: Self-regulated Habituation of Ever-novel Signs via Affective Field

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At the conclusion of our group's presentation at last year's gatherings, we received two questions that this presentation will address: one from Alexei Sharov on the nature of *agency* and another from Vinicius Romanini on the nature of *virtuality*. This presentation will endeavor to rigorously characterize *agency* via *virtuality*. This project's approach to *virtuality* (Bacigalupi 2022) – a dynamically sustained potential in continuous exchange with *actuality*, or structure – will be further explicated via the self-regulation of the habituation of ever-novel signs, all of which necessarily entails a continuous and transfinite *affective field*.

Both Sharov (2021) and Romanini (2006) have written on the subjects of their respective questions. It is therefore a great opportunity to respond with some level of rigor. To do this, this presentation will start with the question of Semiosic Agency: what is it?

A possible answer will be organized into three main sections: the first section will frame the proposed model as a tension in the continuous exchange between *virtual* and *actual* dynamics; to continuously engage and resolve this tension, a physically grounded *affective field* will be proposed in the second section, which will explain how ever-novel signs can be habituated from this tension; the final section will demonstrate that, in addition to habituating novel signs, the system must self-regulate itself so as to avoid perennial "death-states" of over- and under-coherence. The ever-evolving state of this system coherence will be inhered within the *affective field*, which will serve as an index for semiosic viability. And self-regulation to maintain this viability involves two simultaneous, non-stochastic and non-algorithmic choices with respect to this index on coherence: either *tendency* – deciding to "stay the course" – or *drive* – deciding to change the operational course. It will be argued that it is these existential ever-present choices, and the afore-described dynamics manifesting them, that constitute veritable Semiosic Agency.

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Waste and the Second Turn in Biosemiotics

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The main characteristics of the second turn in biosemiotics are: "(a) extending the integration to Saussurean approaches; i.e. developing a general semiotics which synthesizes Peircean, Saussurean and Uexküllean theories; and (b) grounding aesthetics and ideology in biosemiotics" (Chávez Barreto et. al 2022). The second turn was declared only at the beginning of the 2020s, but already considerable progress has been made in the name of this turn. The 2023 Special Issue of the *Biosemiotics* journal, edited by myself and Yogi Hendlin, features contributions that emphasize all these characteristics. Out of control growth and consumption are byproducts of an economic theory of value that is disconnected from the environment but, in order for it to work, Marx's flawed answer to this disconnection must be brought up to date with a contemporary understanding of ecological cost (Hornborg 2001). The arts and humanities are caught in the self-destructive loop of trying to prove their instrumental value and defend their legitimacy against charges of obsolescence from STEM – one reason is that postmodern humanities seem to have no interest in science (Gare 2022). The transdisciplinary framework of biosemiotics offers a solution to this deadlock, but it is still not clear which of the humanities are to blame, and which are unfairly maligned for their postmodernism. For example, second–generation semiology (Kristeva, Derrida, Lacan) is often pejoratively lumped with postmodernism, however, one of the primary tasks of the second turn is to rehabilitate precisely these figures. Rehashing the actual status of the 'postmodern' is a major task of the second turn – it is no longer acceptable to discredit entire swathes of academic, literary and artistic production as simply being 'postmodern' when postmodernism as such is no simple fad or set of whimsical stylistic choices (like montage) – in the 90s the postmodern was only a guess at what was to come, but today it is a ubiquitous state of affairs, where the fluid identity effects of communication technology have obliterated the old idols, and those still trying to turn back the clock are just pissing in the wind. The second turn brings the advancements of biosemiotics to bear upon the most pressing questions of today's supercharged media environment. This entails definite social and existential commitments that not everyone will agree with, the least of which is certainly not the commitment to witnessing the ongoing ecological catastrophe. Probably the status of these commitments will be the source of the most lively discussion.

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In praise of Brainwaves as Tissue. A biosemiotic perspective

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Until discovery of telescopes Saturn was thought, by proto-scientists, to be the last planet of our solar system. Equally nowadays, in anatomic perspective, the skin is considered histologically the furthest tissue that divides us from , and is in contact with the external environment. But exactly as the upgrade of lens technology made observable otherwise invisible objects in the skies, the upgrade in physics of electromagnetic waves by Maxwell led to the discovery of brain electromagnetic waves made observable by electroencephalography 100 years ago.

All around the head exists an appreciable amount of electromagnetic energy brain related. It reaches the skin through bones and goes further. It can be measured as waves with their amplitude and frequency.

After 100 years of study and research, forty of which even I, myself, have worked, I have felt the urge to expose a biosemiotic analysis about the ontological and classificatory status of brain waves in the context of anatomy and histology. Otherwise maybe for next 100 years, brain waves will still be considered devoid of an autonomous status as tissue, differently from blood or connective tissue or nervous tissue. But the urges of times on the technological side find the biosemiotic community structure, both theoretically and personally on the rise.

A serious theoretical community implant that states that life is based on sign action, not just molecular interaction. I hope all the main schools of biosemiotics will best appreciate the nature of a tissue where molecules are zero, made of waves that are mere energy, no mass (or a vanishingly small mass). In that "tissue" persists the pure sign action devoid of the molecular interaction but that is also firmly grounded on solid empirical observables of neurophysiology and molecules.

As the astronomical community discovered Uranus and its meaning beyond Saturn, so nowadays the biosemiotic community has the opportunity to discover a tissue beyond skin. A tissue made of signs, because it has no molecules. A tissue where the basic unit of life is nearly 100% pure biosemiosis deserves a proper ontological status able to be included in an extended view of anatomy, and not only of physiology. Anatomy of waves of course, but not less physical than bones. Tissue of bones gives time to be seen even with no skill. Other tissues need to be fixed and processed to be conserved and studied, otherwise they decay.

This tissue "Brainwaves" has the shortest time possible to be seen because electromagnetic waves are light. One hundred millisecond for waves, 100 years for bones. (Yes you have to be on the ball to catch it on the neurophysiological practice).

Surely far faster in its cycle than DNA expression or protein building, this extreme difference on both planes, of speed and of immateriality do create some difficulties in cognitive acceptance of such a mechanism that extends the depth of semiotic freedom.

Not to be scared by those differences, but we are committed to searching for similarities, a useful ethical choice in "making-meaning" of "Brain Waves As a Tissue" because it's even ours.

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Does biosemiotics need a theory of reading?

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Central to biosemiotics is the process of interpretation, which takes place across all species of life. General semiotics has been enlivened by the concept of 'the text' and the concomitant act of 'reading' (Lotman 1964), with interpretation embedded in it. The term 'reading' clearly invokes a linguistic metaphor, a derivation from literate culture with a fully anthropic bearing. Is such a metaphor of any use to biosemiotics in its resolute commitment to studying semiosis across species and within organisms, the overwhelming majority in both cases being non-literate? Is it even worthwhile as a supplement to interpretation. This paper proposes that a reconsideration of the phenomenon of reading in the light of recent research will contribute to a finer sense of biosemiotics' mission in the academy and beyond. The paper will do this in two main ways. First, it will point to the emerging study of reading processes which demonstrates not a set of cerebral or socio-cultural co-ordinates that are enacted in acts of reading, but the invocation of distributed bodily apparatuses characterized by scalarity (Trasmundi, Toro and Mangen 2022). Second, based on studies of the use of close reading (Cobley and Siebers 2021), it will suggest that embodiment in reading offers indications of what readers seek to get close to when they carry out close reading. In particular, it will be argued that reading closely affords (or at least promises to afford) greater proximity to 'the real' as it is conceived in a biosemiotic frame by John Deely. Deely's distinction between sign, object and thing offers both biosemiotics and the theory of (close) reading a configuration for the recognition of a realm beyond signification plus the possibility of signs signifying beyond themselves and objects. In biosemiotic terms, this entails constraints and agential opportunities. Effectively, ever closer reading, like Achilles' progress in catching the tortoise, will be argued to expand the parameters of the human Umwelt.

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Preliminary Connections with Semiotics in Linguistic Anthropology

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As a newcomer to the field of Biosemiotics, I find the Biosemiotics Glossary Project a fascinating example of intentional interdisciplinary and intercultural communication. Linguists within anthropology have long worked on language contact, i.e. the emergence, maintenance, and evolution of new registers within their cultural contexts. The building of the Biosemiotics Glossary likely displays similarities to the emergence of *contact registers* in other cultural domains, while also potentially exhibiting some interesting differences, in part because of its intentional nature. In the spirit of Favareau and Kull's (2015) *On Biosemiotics and Its Possible Relevance to Linguistics*, this paper will consider linguistic anthropology's potential relevance to Biosemiotics.

Building on the work of widely cited contemporary theorists within the fields of linguistic anthropology and sociolinguistics, this paper will attempt to take small steps in two directions. First, it will sketch some general properties of register emergence (*enregisterment*) to introduce some terms that could be useful for taking a meta-communicative perspective to the interdisciplinary collaboration and communication between scholars building the Biosemiotics Glossary project. Second, it will present a handful of semiotic concepts that have been developed within linguistic anthropology. By connecting them to concepts that have already been added to the glossary (such as *agency* and *intentionality*), I hope to open a dialog about the potential usefulness of linguistic anthropological approaches for Biosemiotic scholarship. This exchange would hopefully also lead to recommendations from seasoned Biosemiotics scholars for concepts from their various disciplines that could be usefully incorporated into linguistic anthropological work.

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Diagnosing, Modelling and Solving Interspecies Cohabitation Issues: Anatomy of the Shared Semiosphere

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In this communication, I will present different steps of diagnosing and modelling a shared urban semiosphere in order to solve interspecies cohabitation issues. Mainly, this presentation will introduce key concepts needed for this work and methods used – what elements should be included in a basic corpus? In a more detailed one? What methodology should be preferred depending on the context and circumstances and what are its potential flaws? How to encourage a good and relevant interdisciplinary dialogue? All these questions will be addressed by presenting and comparing two projects in Paris (Delahaye, 2021) and Tartu, the last one being used as a case study.

In this presentation, we will use the concept of semiosphere as defined by Hoffmeyer (1997) as "a sphere just like the atmosphere, the hydrosphere and the biosphere", incorporating all kinds of "signs of life". In this sense it could also be called in different ways like "semiotic ecosystem" or "ecosemiosphere" (Maran, 2021), to use a specific term with a separate meaning. This question of terminology, as well as others that could lead to confusion, will be briefly discussed.

All the results and methodologies introduced in this communication are from a just-completed project in Tartu, aiming to study relationships and interactions between humans and liminal species, using the urban corvids as a case study – *Corvus cornix*, *Corvus frugilegus*, *Coloeus monedula* and, to a lesser extent, *Corvus corone* as comparative observations with the city of Paris.

Results obtained will include elements of ethology or biology, elements of anthropology and literary elements, in order to present an exhaustive overview of this fundamentally interdisciplinary methodology. Methodological tools will be given in order to make these different and various components interact in an efficient way and to allow a potential investigator to interpret them in a relevant manner, no matter their academic speciality or background.

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Origins and Phases

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Classically, the quest for the origin of a complex and dynamic entity -be it life, mind or semiosis- seems to demand an explanation of how this entity may have spontaneously emerged as a functioning whole without any prior equivalent. Analysing the full-fledged system one can identify its components, but these are typically too complex and too specific themselves to have emerged independently and to have self-organised as a coordinated system after a chance encounter. Therefore, the main challenge of origin questions is to find scenarios of how simple unstructured systems can become structurally and/or functionally more complex without a *deus ex machina*. A plausible scenario for the increase of complexity seems compartmentalisation in a system.

The spontaneous emergence of compartments of different viscosity in a mixed liquid (the so-called Liquid-Liquid Phase Separation) is a long-known phenomenon in physics. An equivalent of such relaxation processes involving biological matter first stroke biologists' attention in the context of pathological conditions such as amyloid formation in some neurodegenerative diseases. Yet progress in scientific research demonstrated that the emergence of separate domains with distinct phases plays an equally important role in healthy life processes. The expansion of research interests eventually created a need for a more general notion than Liquid-Liquid Phase Separation. Some recent research articles suggest the more general term Phase Separation (PS) in order to also include separation processes involving biological macromolecules that can take on various tunable viscoelastic phases that cannot be categorised as a liquid. Also, the energetic character of phase separation has a richer repertoire in biology: while it is typically a passive relaxation process in physics, in biology also active control mechanisms can be at work in compartmentalisation and complexification. It is not a coincidence that models for the origin of life-from Oparin's coacervation hypothesis (1924) to the more recent ones such as Sharov's "Coenzyme World" model-all rely on LLPS mechanisms.

More than half a century before the recent findings of biophysics on the significance of phase separation, Gilbert Simondon borrowed the same notion from physics and generalised it as one of the critical concepts of his ontogenetic theory [1]. In order to have an all-embracing theory, he differentiates between three operational modes of the process of individuation: physical, vital and psycho-collective. His theory places at the beginning of any process of individuation the so-called *pre-individual* being, which is in a state of pure potentiality and tension where no phases exist. In this *metastable* state, the slightest perturbation can unleash the process of individuation leading to the emergence of different phases both as spatial compartments (topological domains at distinct phases of matter) and temporal ones (distinct stages of the process). Simondon calls this operation phase separation ("dephasing" – Fr. *se dephaser*). In the physical mode of individuation, phase separation refers to the same relaxation process known in physics, which ends at a stable state where all tensions are resolved and all potential becoming are exhausted. In more complex systems, however, the conflicts and tensions within the pre-individual being can only be partially resolved, such that some portion always remains unresolved as "pre-individual charge", leaving room for further individuation. Therefore, one can say that phase separation offers a mechanism not only for the origin of life but also for the permanent origination potential that is characteristic of life.

When interpreted in the light of Simondon's Theory of Individuation, the thriving findings of biophysics research on phase separation can be said to demonstrate how vital individuation operates at the molecular level, generating structures and processes with limited stability. Some of these can be further stabilised by new phase-tuning mechanisms that emerge at later stages of individuation and thereby constitute strictly conserved codes, while others remain less stable and, therefore, more prone to external influences. This reminds us of the Code Duality thesis proposed by Hoffmeyer and Emmeche [2] as 'the chain of events which sets life apart from non-life.... needs at least two codes: one code for action (behaviour) and one code for memory', and seems to offer an explanation of how these different codes may have emerged in the course of vital individuation.

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Sebeok's Razor and the Sign of Three: Hoffmeyer, Chomsky and Mandelbrot

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This presentation will be based on historical archival research conducted at the Thomas Sebeok Archive in Bloomington Indiana, and will review four emblematic and revealing correspondence the researcher held. Sebeok's three chosen interlocutors for this presentation are Jesper Hoffmeyer, Benoît Mandelbrot, and Noam Chomsky. The 'decisive' correspondence the scholar had with Jesper Hoffmeyer in the 1990s will be reviewed, as well as the forgotten exchange of letters he had with Benoît Mandelbrot in 1961, 20 years before the mathematician developed the field of fractal theory and, finally, the correspondence he held with Noam Chomsky in the seventies where the principle of the Occam Razor and ironies were very present. Each correspondence will enable me to argue something larger about the history of biosemiotics, namely the role of political and economic context, serendipity, and the role of forgotten actors or 'little hands' of science.

First, the content of the correspondence will be analysed, and more importantly, the form and the tone, as theorised by the meta-historian Hayden White. Moreover, this presentation seeks to illuminate not just the intellectual context and debates in which the actors were swimming (and sometimes against the current) but also will devote time and attention to excavating the political and economic contexts, which no doubt played their part in the successes and challenges the actors met. On the context side, I will, for instance, mention the evident role of cold war politics but also stress the role Sebeok's academic secretaries played in his career (their assigned tasks far-exceeding their academic roles when requested to buy him a razor or deal with after-sales service for Christmas gifts for his children, to mention two examples). For the style analysis part, I will highlight the role of apologies in Thomas Sebeok's prose, irony, and 'awe' vocabulary. Therefore, following a similar method, I strive to uncover the particular aesthetics and creative aspirations encoded in the various speakers' self-imagination and expression, most notably Jesper Hoffmeyer.

Finally, this presentation will ponder if Thomas Sebeok theory and Jesper Hoffmeyer theory of semiosis can be applied to their own method of working as revealed by the archive. Drawing on their own insights, the correspondence analysis may serve as a compelling example of how semiotic theory can shed light on its 'birth' as a field of interest. Furthermore, Sebeok, Hoffmeyer, Chomsky, and Mandelbrot's letters reveal a rich interplay between language, posture, and broader political and economic context, illustrating the complexity of the semiotic process they were subjected to, while theorising it in their own way. By applying their own insights to their exchange, after having preliminary reviewed their posts following a method developed by Hayden White, this paper seeks to contribute to the ongoing project of building a more comprehensive and nuanced understanding of the epistemology of early biosemiotics inquiries.

An Evening with Jesper Hoffmeyer

A Video Interview by Donald Favareau
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In this half-hour video presentation, Jesper Hoffmeyer recounts his early days as a "positivist" biochemist, his involvement with the radical student movement in Denmark and Paris in 1968, and how he came to help initiate the current project of biosemiotics – as well as how he sees the future development of the field.

Recorded on August 17, 2016, this interview would turn out to be the last one he would ever give before the advent of the stroke that would from that time forward impair his speaking capabilities, but not his endlessly active and creative mind.

We are delighted to be able to share excerpts from this fascinating two-hour interview at this commemorative Gatherings in his honour, and to have Jesper with us once again share his warmth and wisdom in his own inimitable voice and fashion. The showing of the video will be followed by a short Q&A with the filmmaker, and a panel discussion with some of Jesper's colleagues from the early days of biosemiotics

The Importance of the Concept of Umwelt in a Changing World

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In the last decades, humankind has been experiencing the cumulative effects of a profound technological development that has accelerated immensely the dynamics of human social life, that has been reshaping the human sphere of action and interaction, that has hybridised human reality by merging the natural and the artificial, creating new possible forms of agency and consequently new lived worlds.

According to Ferreira (2018, 2021, 2022), the deployment of artificial cognition in the twenty-first century, has introduced a fundamental twofold ontological shift: (i) tools have lost their purely instrumental status and have suddenly become potential autonomous entities capable of a form of shared agency when co-acting with humans and even capable of decision making in multiple circumstances (ii) the environment, on the other hand, has acquired a hybrid nature, where the analogic and the digital merge and where the physical and the virtual converge, where natural intelligence and autonomous artificial systems cohabit in a fusion that blurs the lines between the physical, the digital and the biological.

As Jesper Hoffmeyer pointed out (1996, 2008), life is fundamentally grounded in semiotic processes. The present paper claims that Uexkull's concept of Umwelt and Hoffmeyer's concept of Semiosphere play an essential role in the identification of the phenomena that the present technological (r)evolution brings about and in the analysis of its own dynamics.

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The biosemiotic process: How to reproduce & adapt the identity of social systems by combining emotions & language

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Biosemiotics concerns the process of learning of complex adaptive systems that operate across multiple scales and levels of organization. This comprises the formation of informed autocatalytic processes (functional cycles) that can express an adaptable identity by establishing an impredicative entailment between the (tangible) biophysical expression of a complex metabolic pattern and a (notional) "expected state". Reproducing and adapting this identity requires effective communication within semiotic controls. By iterating the making of models of themselves (on the notional side) and the instantiation of these models (on the tangible side) these systems manage to preserve the meaning of tangible information carriers used in this communication. In this way, the identity of the biosemiotic process remains the same (at the level of the whole) even when the various elements – the types in the models (on the notional side) and the instances in the metabolic networks (on the tangible side) – change in time. Thus, the biosemiotic process makes copies of itself through time, but these copies neither refer to specific instances of structural elements nor to the representations of the types recorded on the notional side; they refer to holons instead.

I postulate that the differences between the semiotic processes in ecological and human systems are related to the use of a language in the human system that permits a reflexive definition of identity. Humans must define their own group identity (to be preserved) using themselves as an external referent. To do so, they create an exosomatic mind—i.e., a collective UMWELT and awareness tailored to the chosen group identity—that is described and operationalized by using a language. This represents a major complication in their biosemiotic process (i.e., the mind versus body bifurcation). Luhmann suggests that the formation and evolution of human society is determined by an iteration between: (i) communications (in the notional part—REPRESENTATION) carried out by the collective MIND that stores, reproduces and updates the existing knowledge claims, anticipatory models, institutional organization, rules and norms; and (ii) interactions (in the tangible part—ACTION), needed to check the viability of the metabolic pattern associated with the reproduction and operation of its structural and functional components (humans and technological devices). The resonance between communication and interaction relies on the same strategy as adopted by ecological systems (the adaptive cycle): human societies send messages to themselves across hierarchical levels to achieve TRANSDUCTION. In ecological systems transduction is carried out by biophysical processes regulated by codes – using either types to make instances (downward causation) or instances to define types (upward causation). In human society, on the other hand, this commuting across the epistemic cut (notional/tangible) takes place across two external contexts: (i) the psychic structure—"the body" of the society (the endosomatic experience of feelings of individuals). Here emotions, fears, aspirations, and dreams affect the definition of the group identity (final causes) and therefore ultimately affect the "rational decisions" of the mind; and (ii) the biophysical context of the metabolic network that determines the feasibility and viability of interactions. The communications that a society transmits to itself are sent and received by many different purpose-driven agents operating within different UMWELTs. The meaning of this heterogeneous flow of communications (based on non-equivalent external referents and non-reducible types of awareness) cannot be preserved by using a formal language, but only by shared feelings associated with affective interactions in the psychic structure.

The Creative Porpoise Climbs the Semiotic Scaffolding

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One of Jesper Hoffmeyer's many innovative concepts in biosemiotics was that of *semiotic freedom*. I propose to relate Hoffmeyer's idea of *semiotic freedom* to Gregory Bateson's concept of *levels of learning*, by way of describing an experiment in porpoise learning which was inspired by Bateson's observations of human-porpoise interactions in a performing oceanarium setting.

In this oceanarium, the Sea Life Park in Hawaii, in the middle 1960s, the public was told that what they were observing in their entertainment was porpoise learning, according to the accepted canons of behaviorism at that time. Bateson noted that this was impossible, since the same porpoises put on six shows a day five days a week, thus they could not be learning anew each time. On the other hand, it would spoil the illusion if a tourist saw the same porpoise learning the same thing again.

Bateson postulated that the porpoise must achieve a learning at a different "level," i.e. that what the trainer wanted was for the porpoise to produce a *new* behavior when called upon to do so. Bateson proposed to demonstrate this experimentally. The experimental porpoise was subjected to several sessions just as the show porpoises had been. In each session the porpoise is frustrated by not being rewarded for the same behavior as in the previous session. At about the fourteenth session, the porpoise dances excitedly in the tank and produces twelve new behaviors in sequence, four of them never seen in the species before.

The behaviorist concept of a "behavior" (which Bateson did not use unironically) must of course be critiqued. What the trainers called a behavior is a part of a human-animal relationship, involving for the porpoise a decontextualizing of some habitual response to the porpoise's *umwelt* which is then re-porpoised (so to speak) into the new context of the human-porpoise "show" encounter. This is a kind of biosemiotic *transfer* from what the behavior means in its originary porpoise context, and the porpoise's capacity to do this may point to a precursor of *symbolic* sign use.

This may especially be true given the ability of the porpoise to demonstrate learning at the conceptual level of the ability to produce *novel* (or *creative*) recontextualizations of behavior. (The trainer herself, Karen Pryor, in spite of her ostensible behaviorism, entitled the chapter she wrote about the experiment "The Creative Porpoise.") Bateson considered this as learning at the level of category, inspired by mathematical and philosophical concepts of the early 20th Century. Peirce might have seen it as an exemplification of his phrase *the habit of habit change*. And Hoffmeyer would very likely have seen it in the context of *semiotic scaffolding* – related to an increase in what he called *semiotic freedom*.

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Human *Umwelten* at the Crossroads of Biosemiotics, Biopower, Biopolitics & Self-technology

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The connection between biosemiotics, biopower and biopolitics has been a subject of debate among scholars, but there is still much scope for further research. With particular recourse to the biosemiotic concept of human *Umwelten*, this paper investigates this connection and further elaborates how combining these areas of study might constitute a transdisciplinary yet coherent object of research.

The paper argues that Uexküll's human *Umwelten*, Michel Foucault's biopower and biopolitics, all deal with the construction of human as subjects. It further argues that Uexküll's *Umwelt* theory appropriates Kant's concept of "transcendental subject", but paradoxically infuses it into 19th century biology to regard life as a naturally living system, and a biological disclosure. The latter well elaborates the species-specific characters and individuality of human *Umwelten* in the perspective of biology, but leaves this question unsolved: how to explain the *sensus commus* among transcendental subjects within the scaffolding of *Umwelt* theory. Subject and biological life are precisely the issues with which Foucault's work on biopower and biopolitics are most concerned. Foucault's proposal that the subject is a product of knowledge and power relations extends Kant's research on the transcendental subject to an empirical subject that is constructed through its biological existence, and existence in labor and language. It thus can be regarded as a response to Kant's most significant and ultimate philosophical question, "what is human?" In this sense, Foucault's conceptualization of "subject" might be helpful in tackling Uexküll's unsolved question, and it would further highlight the significance of discourse in distinguishing the construction of human *Umwelten* from that of other species.

This paper argues that Foucault's research on self-technology, or, to be precise, *l'art de souci de soi*, concerning a subject's relation to itself and the turning of observation of the outside world back inside, inspires us with the idea that autocommunication is a critical or even prior step in the construction of human *Umwelten*. *L'art de souci de soi* is often taken as a kind of existential aesthetics, since it leads humans to pursue freedom in material and everyday life; thus, once again, it speaks, though indistinctly, to Kant's idea of ascending from understanding nature to the pursuit of freedom which constitute the full scope of human's capacity of recognition - the same realm of human *Umwelten*.

Given that contemporary biology regards life as molecularized and life science as engaging in the endeavor of re-devising life, which, consequently, complicates the relationship between a biological "ego" and the subject, this paper, through the lens of the concept of human *Umwelten* and its connection with self-technology, also attempts to have a dialogue with Nikolas Rose's interpretation of self-technology as the positive and responsible conduct of humans' ethical undertaking of their sign activities when encountering with this new reality.

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Biosemiotic Bottom-Up Emergence in the Key of Teilhard de Chardin

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What are the cultural implications of understanding how evolutionary biological constraints gives rise *to* them? (Cobley 2016) Biosemiotic constraints through iterated interactions between individuals lead to a 'pattern of variety-in-unity' (Teilhard de Chardin 1961, p. 18). Biosemiotics from an evolutionary perspective (Sharov 1991) provides an awareness for how sign systems of species communication develop through certain patterns over time. The work of Pierre Teilhard de Chardin describes these patterns in *The Phenomenon of Man* similarly as a bottom-up emergent phenomena across cultures into what he calls the *noosphere*. In this domain, Teilhard's work proves particularly useful for tracking the development of sign systems of cultures, as he accommodates both science and religion. Especially, insofar as he takes the scientific study of biological constraints to explain the emergence of conscious integration beyond what he calls 'organic individuality' to account for culture and its immaterial level of 'co-operative interthinking.' (For a more recent take on this, see Hovhannisyan and Vervaeke 2022.) This 'psychosocial' aspect of the *Umwelt* arises from a bottom-up emergent pattern with the emergent pattern of stars and atoms alike, for Teilhard, envisioned akin to the cosmos as a 'global unity of mankind's noetic organization or systems of awareness, but [with] a high degree of variety within that unity' (pg. 28).

In contrast to current top-down industry capture through marketing (Hendlin 2019) and polarized politics in the aftermath of the postmodern century, a lens that combines biosemiotics and Teilhard's work may offer avenues to supersede this attenuation of semiotic sensitivity. Ivar Puura's notion of semiocide as impairing the other from realizing their semiotic identity (Maran 2013) can be interpreted as the end result of semiotic instrumentalization – which occurs when we do not realize our co-emergence out of a more replete universal biosemiotic pattern. Keeping in mind the greater unifying framework which underpins our existence may allow individuals to disagree on aspects of their perceived realities without undermining their collective goal of cooperation for preserving the semiotic specificity that has emerged through particular traditions of habit and habitat. From an ecosemiotic perspective, denying humans our evolutionary biological need for cooperation and community can be glossed as another form of semiocide. This presentation explores techniques of opening the aperture of awareness of ecosemiotics in humans, including the methodologies of participatory action research and other technologies of entrainment across perceived ideological or species barriers.

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The Cognitive Spiral: Semiotic Freedom & Space

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Space has history and has taken different forms in different societies and at different times depending on the experiences accounted for and the available means to externalise and represent these (Jammer 2013). The representation is conditional on the technique used, delineating a cognitive loop between representation and comprehension that narrows the conception of space to a direct reference to that which is perceived. In other words, the method of representation determines the perception of that represented, and vice versa. A self-reinforcing cycle between inner "mental" space and outer world, whereby cognition is a form of niche by which we adapt to and mould the world according to our purposes and desires.

Geometry is one way experience is replicated and through which problems are solved. "[A] certain schematization of experience, which we may call space [...] in the sense that it is formed from experience by the application of some principle (Wiener and Masani 1976:99). Peirce does not say much about space but what he does say correlates with Uexküll presentation of space because their thinking is based in sign-action. In *The Order of Nature* Peirce emphasises there are "general truths" that are so extraordinary that "even if we are to suppose that they are not strictly universal truths, we cannot possibly think that they have been reached by pure accident." And that the "most remarkable laws of this kind are those of time and space" (EP1:180). He implies space is not just an idea, but a fundamental feature of life, tied to causal relations between things and their effect in the process of perception-action. Peirce presents, albeit in nascent form, space to be a product of excitation produced through sign-relations, which correlates with Uexküll's definition. For, like the idea of 'force', "in its rudiments, is another conception so early arrived at, and found in animals so low in the scale of intelligence, that it must be supposed innate" (EP1:180-181). A scaffold, or natural law which is an essential component of living things. From the simplest to the most intricate. "The great utility and indispensableness of the conceptions of time, space, and force, even to the lowest intelligence, are such to suggest that they are the results of natural selection. Without something like geometrical, kinetical and mechanical conceptions, no animal could seize his food or do anything which might be necessary" (EP1:181). We might infer from this (on the premise that an organism's world is constituted of a plethora of signs available to it) the first principle of Umwelt theory; that the synthesis between an organism's and its environment expands relative to the complexity of the organism. Hence space is defined by an organism's semiotic freedom. In Uexküll we find the biological roots of space, and in Peirce we find the semiotic supposition for the forming of space (understood to be a network of relations), to be a process of sign-action.

I aim to illustrate how the above Peircean-Uexkullian notion of space infers a cognitive spiral whereby space (or a cell-centric model of) extends from a fundamental model (i.e., that of a cell) to more developed, nuanced and complex forms of space (such as our own); and that this corresponds to the idea of a developmental process, or stages, of spatial intelligence, which transfers through human cultural representation and the built environment.

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Refining how the term 'Icon' is conceived as a Step towards Nomothetic Descriptions of Behavioral-Ecological Events

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The term icon is ubiquitous. For example, in linguistics iconicity is conceived as the relationship between speech acts and meaning whereas in semiotics broadly, iconicity is conceived as a grounded relationship between an icon and its referent. While these examples may be easier to reconcile than not, fresh confusion has been introduced by Hoffman, Manish, and Chetan's (2015) 'Interface Theory of Perception' (ITP) within perceptual science. The ITP also invokes icons as a foundational component. But are Hoffman and et al.'s 'icons' the same as semiotic 'icons'? If not, can these two definitions of 'icon' be reconciled? Taking their cue from von Uexküll, the ITP posits that all biological organisms interact with the world via a species-specific user interface similar to a computer. The ITP builds on a theoretical assumption that perception did not evolve to represent reality as it is, but rather to represent reality as it is useful to an organism thus maximizing fitness function. Consequently, perceptual structures simplify reality to order and discriminate information and quell choice paralysis. Continuing with the computer analogy, the ITP proposes that what organisms see as external objects are no different from computer icons. Icons in this way hide the complexity of a computer's hardware and software and provide users units of interaction that are functional. Following Deely's view that icons represent the first contact between sense perceptions and reality that generate initial qualitative experiences, and Hoffmeyer's description of iconic and indexical scaffolding, we hope to show that the ITP icon and semiotic icon are one and the same. Providing some conceptual clarity for the term icon is important to minimize confusion amongst interested scholars. While potentially enriching, a plurality of understanding can create challenges for interdisciplinary collaboration where the same analytical terms may be invoked with reference to a problem or event, but understood differently by the parties involved.

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The concept of umweb: On the linkages between umwelten

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Umwelt, the concept introduced by Jakob von Uexküll, has been commonly defined as the subjective world of organism. Once an organism can make distinctions, once it uses signs and can choose, there should also be its umwelt – its world with meanings. On a closer inspection, however, there are at least two different concepts behind this term, when taking into account the relationship with time: *momentary* and *distributed*.

Momentary umwelt is umwelt in its proper sense – the meaningful world of an organism. Meaning is the relation that exists now, at the present, atemporally (synchronically) in the subjective time. This is a simultaneous existence of distinguishables, which are the possibilities or the options for behaving. Distinction itself is a relation. Since such is the core sense of Uexküll's concept – the subjective space in the identical time – we reserve the term umwelt to this concept.

Distributed umwelt is the web of meaning-relations over the course of time (diachronically), both intra- and inter-organismically. For this we propose the term *umweb*. Umweb is the whole set of sign relations that organisms have throughout their life. Umweb is the complex or nexus of habits. Habits are relations, and their relata can belong to one and the same organism, or to behaviourally linked organisms. Since such relations can include other organisms in one's umweb, and sometimes mutually, it means that these organisms are semiotically linked. Through such relations, umwelten of different organisms are encompassed by the umweb.

There exist some close notions to umweb. Uexküll himself uses the term 'umwelt tunnel', meaning by this the temporal sequence of an organism's subjective moments during its ontogeny or life cycle. We would describe umweb as the complex of semiotic relations in which the organism is involved, while umwelt tunnel is the sequence of momentary umwelten. Another concept somewhat close to umweb is 'semiosphere', the term introduced by Juri Lotman and later independently by Jesper Hoffmeyer. Semiosphere includes meaning-relations of all agents, thus serving as a cover term. Among close concepts we also find 'Lebenswelt' as a solely human umwelt, 'actor-network' as a material-semiotic network of agents, and 'chronotope' as the spacetime of a narrative.

Another theoretical innovation besides introducing the concept of umweb concerns the role of umwelt as such in the fundamental model of meaning making. Our point is that signs cannot be outside of an umwelt. This implies that semiotic research should not be limited to the study of signs; the larger whole, which is the umwelt, must always be included. This is what we would call *umwelt-based semiotics*. Accordingly, the relationship between sign, semiosis and umwelt has to be elaborated.

We are going to argue that in addition to Peircean semiotics, which is based on the concept of sign, and Saussurean semiology, which is based on structure and codes, semiotics can fundamentally be built on the Uexküllian concept of umwelt. Moreover, umwelt-based semiotics enables the integration of these rather separate and incompatible semiotic theories.

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Time & Emergence: Towards a narrative-inspired understanding of temporal semiosis

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What is the nature of time? Since the Einstein-Bergson debate this question has often been divided into two camps. One camp approaching space-time in a point-like manner in terms of mathematics and/or physics, and a second camp favouring an anthropocentric phenomenological approach which understands this experienced temporality as irreducible to the ontological universality of Einstein's space-time. In contrast, this paper brings these two camps closer together by showing how temporality should be understood as an emergent phenomenon in the context of teleodynamic organization. This third approach leaves open a variety of roles time can play in different forms of dynamic organisation, providing a more comprehensive understanding of its role in semiotic dynamics. Biosemiotically, this also accounts for and affords time's experience according to diverse *Umwelten*.

Terrence Deacon's model of autogenesis is shown to follow the same minimal logic of narrative exemplified by Claude Bremond's structuralist writings on minimal narrative logic (Bremond 1980). By subsequently comparing Paul Ricœur's narrative extension of hermeneutic temporality (Ricœur 2008) with how "inside and outside" are divided through individuating processes found in Deacon's simplest model of teleodynamics, the autogen model (Deacon 2013), is set out to understand temporality in this minimal form. Specifically, Ricœur's embracing of what he calls the *aporetic nature of time* is taken up, which in part can be understood as the incommensurability of cosmic time ("universal" time i.e., the regular movement of celestial bodies) and phenomenological time (lived experience of time). By subsequently unstably "resolving" these two times in a continuous mimetic narrativization, Ricœur's narrative temporality reveals itself in congruence with the emergence of teleodynamics. We find similarly in teleodynamics that the difference between "inside and outside," while never "resolved," is mimetically mediated in (not) realizing the purpose expressed in the direction of teleodynamic organization.

It is then necessary to consider the threefold aspects of time in this context; (1) time "inside" which deals with change in terms of internal autocatalytic reactions necessary for autogenesis, (2) time "outside" which is the change in context of the autogen's environment, and (3) in the process where "inside" and "outside" come together as mediated through attaining the purpose of its own self-replication. Neither (1), (2), or (3), can therefore be taken by themselves, nor can they be reduced to a mere point in time as they all have a duration which influences the eventual success (or failure) of the self-replication. Insofar that more or less time is spent in relation to each could influences the outcome of self-replication, a shift to a kind of temporal "thickness" is required capable of dealing with time in terms of meaning-making. This is "thickness" to the extent that it is the duration of time spent autocatalyzing (1), the duration of being in a contextually changing environment (2), and the duration of the process of self-replication (3) which influence the successfulness of attaining the continuation of this proto-evolutionary line. This extends work in biohermeneutics which till now had limited exposure to narrative temporality, some exceptions being the work of Arran Gare and Anton Markoš. Introducing a narrative model of time to the emergence of semiotic dynamism capable of supporting meaningful time differentiation.

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Biological Writing: An Appendix to The Language Metaphor of Life

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The language metaphor of life has been proposed as an analogy to the linguistic model, where a specific biological level corresponds to a specific language level (DNA bases correspond to phonemes, triplets of bases correspond to words and genes correspond to sentences). This presentation is a reconstruction of the original language metaphor of life (Jakobson 1971) and will focus on two main axes. The two axes are built on a critical reading of F. de Saussure and the postulates of modern linguistics about speech as primary semiotic system and linearity as the second principle for language in CLG (1916). Firstly, Saussure's privileging of speech over writing is reconsidered. Jakobson's analogy starts with phonemes and naturally leads to replacing phonemes with written units of the genetic phonological alphabet, or the "letters of the genetic alphabet". Here we unexpectedly bring the critique by Derrida (1967) or Harris (2000) of the overestimation of the phonological alphabets in the western cultures into biology, and propose an alternative to the Jakobsonian language metaphor of life: we can imagine for the genetic script, rather than phonological alphabet, some kind of pictographic or logographic writing system reminiscent of Egyptian hieroglyphs or Chinese characters. As proposed by Anton Markoš, in some cases DNA bases are not read base by base, but by the superficial structure of triplets, that is, by the spatial shape of a triplet. This observation leads us to understand the DNA script as composed not of discrete digital units of second articulation but of compositional units defined by first articulation only[1]. The second axis then develops the question of the supposed linearity of the genetic text. Jakobson's original metaphor led to the reduction of complex genetic texts into digital linear strings transcribable by a computer. Privileging speech over writing misapprehends the genetic script as a phonological, discrete and digital text. With the proposal to replace speech by, ideographical or pictographic writing, linearity is no longer a condition for the genetic script. As a conclusion, it will be demonstrated that the language metaphor of life can be dimensional, processual and dynamic.

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Deleuze and Biosemiotics

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The aim of this paper is to establish a clear link between biosemiotics and Deleuzean philosophy. This can be done by highlighting the affinity in Deleuze's work to theories of autopoiesis and organic/biophysical sense-making. A compelling through-line can be drawn between Deleuze, theories of living systems, and biosemiotics in the way an organism, as emergent assemblage, territorializes its world. If expression is considered as a continual modification of a system of interactions with an external milieu, it is fundamentally interwoven with a notion of "effective action" or the cognitive activity inherent to living systems. From the perspective of biological systems theory, cognitive activity produces a surplus of signification, an *Umwelt*, or world of meaningful interactions for the system. Biosemiotics teaches that lower-level (but no less essential) processes not only ground higher order structures from which meaning emerges, but are themselves meaning-making. Contingent molecular interactions in turn enable the organism to engage with and make sense of a world. Sense-making, the result of a complex of recursive, embodied activity allows us to ultimately acknowledge concepts such as "mind" and "subject" as not only wholly embodied, but grounded in a single, creative biophysical process. Specifically, I will focus on the cell as an organic semiotic system and the processual relation between cognition and language. The living cell, as a result of its function as a bounded system, marks inside and outside, establishes a set of lived relations, enacts a repertoire of behaviors, and establishes the foundation for a self-other distinction.

In order to make my case, I will begin with an analysis of double causality in Deleuze's early book *Logic of Sense* before linking it to a reading of double articulation in the third chapter of *A Thousand Plateaus*. The former presents a philosophical overview of internal dynamics that is later recast in an explicit discussion of living systems in the latter. Along the way, my readings will be mediated by insights from autopoietic theory, namely those of Maturana and Varela and the work of Evan Thompson. Securing both a philosophical and a biological understanding of dynamic systems in Deleuze foreshadows a reading of autopoiesis as a theory of biosemiotics which in turn substantiates biosemiotics as at once a scientific and an aesthetic theory of subjectivity. Biosemiotics as a discipline bridges science, theory, and the arts. A Deleuzean biosemiotics coheres and mobilizes these concerns and, in my estimation, remains the only approach that is consistently biophysically and aesthetically productive from the point of view of individual subjective emergence.

Umwelt as a trans-sign network or the implications of biosemiotics to humanities. The revisited notions of culture and the 'natural' environment

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The main thesis of the proposed talk is that biosemiotics has significantly changed and reformulated the way humanities-related scholars think about culture. For instance, one can mention here posthumanism, post- / nonanthropocentrism, nonhuman subjects' studies, ecohumanities and many more. The biosemiotic inspirations are noticeable in the theories of the subject – one can reflect on human and nonhuman subjectivity, agency and freedom, environment, ethical issues and – finally – the artificial opposition of nature and culture. When seen as a complex of interrelated Umwelten, and, as a result, as a complex of interrelated functional circles, culture turns out to be quite different entity than humanists tend to think. Considering culture as a set of ecological relations and translations rather than an exclusively human world, sheds a new light on environment and 'being-in-the-world' issues.

Referring to some fundamental (bio)semiotic concepts, i.e., Umwelt theory, semiobiosphere and semioethics, reciprocity and coexistence (with reference to Susan Petrilli's and Augusto Ponzio's ideas) the issue of responsibility, involvement and engagement can be discussed. Being responsible for the biosphere considered as a living whole means being responsible for the whole planet and all living beings – both human and nonhuman. Petrilli herself referred to the Umwelt theory, emphasizing its translational nature (an intersign or trans-sign network), and discussing two types of semiosis (modeling and communication) and the very process of semiosic fluxes across different biosemiosic phenomena. Petrilli's position is going to be juxtaposed with some concepts introduced and elaborated by Jesper Hoffmeyer, esp. the semiotic freedom and agency in relation to the living being's creative response to its surroundings and anticipation. With this in mind, I will discuss the artistic projects by Diana Lelonek *The Center for Living Things* (2019) and *Wasteplants Atlas* (2021), demonstrating, on the one hand, the interdependency of humans and nonhumans, esp. in reference to the nonhumans' settings which are, at the same time, the posthumans' ones, and the plants' agency, creativity and semiotic freedom on the other. Hereby, the need of reformulating the very notion of culture and the idea of what is 'natural' with the tools offered by biosemiotics, especially by the Umwelt theory in the Petrilli's interpretation, seems to be even more clear and realistic.

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The Nature of Living Being: Distinguishing Distinctions

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The main ideas of the recently published book in the Biosemiotics series, *The Nature of Living Being: From Distinguishing Distinctions to Ethics* will be presented.

Living beings are distinguishing distinctions. Single cells and multicellular organisms maintain themselves distinct by drawing distinctions. This is what organisms are and what they do. From this starting point, key issues examined range across ontology, epistemology, phenomenology, logic, and ethics. Topics discussed include the origin of life, the nature and purpose of biology, the relation between life and logic, the nature and limits of formal logic, the nature of subjects, the subject-object relation, subject-subject relationships and the deep roots of ethics. The book provides a radical new foundation to think about philosophy and biology and appeals to researchers and students in these fields. It powerfully debunks mechanical thinking about living beings and shows the vast reservoir of insights into aliveness available in the arts and humanities.

Semiosis, Sense-Making, and the Being of the Between: Integrating Autopoietic Enactivism and Biosemiotics through Relational Biology

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This talk will investigate the autopoietist's theory of the continuity between life and mind under the auspices of a biosemiotic approach to enactivist philosophy of mind, with a view to resolve a deep-seated tension between the essence of life and mind (cognition). As proponents of the theory claim, where we find life, we find mind. Life and mind derive from the same set of organizational and functional properties, and those that define mind are an enriched version of those fundamental to life. In particular, it is those self-organizing features of mind which are enriched from those typifying life. The talk proceeds in a three-fold manner. Firstly, it queries the foundation of autopoietic theory to uncover the roots of the multi-varied criticisms levelled at the thesis. Secondly, it looks at the recent controversy between classical autopoietic theory and advocates of the free-energy principle and predictive processing theories, who contend autopoiesis fails to account for the anticipatory and future-oriented aspect of cognition. Thirdly, biosemiotic enactivism is shown to heal this disharmony by providing a more robust theory of autopoietic self-organization via Peirce and biosemiotics, not only more thoroughly grounded in the metaphysics of complex and self-organizing systems which underpin both the autopoietic and biosemiotics paradigm, but also through a demonstration of the sign as a unifying foundation of both autopoietic self-organization and meaning and anticipation. Finally, it will be argued that modelling biosemiosis under the auspices of autopoietic biology and anticipatory systems gives a far richer and nuanced picture of the dynamics of the sign simply unavailable to classical semioticians, and does justice to the prescience and insight of C.S Peirce. Ultimately, a biosemiotic contextualization of autopoiesis is touted as an attractive *via media* between enactivism and free-energy and predictive processing approaches.

Biosemiotics as a theoretical framework to approach the human gut-microbiota-brain-axis

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The human brain has approximately 86-100 billion neurons; however, the enteric nervous system has an estimated 200 million neurons, which is why our gut is called the "second brain". Both systems connect through several sensors, microbes, and cells (Sarkar et al., 2018); host and microbiota interact continuously.

The gut-microbiota-brain-axis (GMBA) is a communication network which engages in a constant and complex dialogue. It connects the central nervous system (CNS) and the gastrointestinal tract. The brain, immune cells, and gut microbes communicate through signaling pathways and soluble factors such as cytokines, central lymphatic vessels, vagal connections, amino acids, neurotransmitters, hormones, and neuroactive metabolites (Sarkar et al., 2018). These communication elements can directly affect the gut, CNS, and immune system and indirectly affect the brain. Despite some disagreement, several studies have shown that the gut microbiota influences cognitive functions (Sarkar et al., 2018).

In this study, we present biosemiotics as a theoretical framework to explain the biocommunication occurring in the GMBA. We will use tryptophan-serotonin signaling as an example of neurotransmission and examine how Jesper Hoffmeyer´s semiotic scaffolding is one of the best ways to approach semiosis in this pathway. *Do microbes communally work with host cells?* Is their behavior part of a "shared agenda" (Hoffmeyer, 2014) or are they capable of making individual decisions? Is health, a continuous *peaceful coexistence* (as Hoffmeyer says) *between the host homeostatic mechanisms and microbes*? Is a disruption in this "blissful state" what leads to disease, to cognitive impairment? These are some of the questions that we pretend to answer, and that will lead us to reframe others as the ones proposed by those working on research regarding the use of pro(psycho)biotics as therapeutics.

As pointed out by Sharov and Vehkavaara (2015), "Biosemiotics should include both object-agent and meta-agent perspective in studying signs processes in living organisms" and "the importance of studying molecular interactions through biosemiotics terminology gives us a wider view of the problem" (Sharov & Vehkavaara, 2015). A holistic approach is the only path to truly understanding the human-microbiome interconnection, and biosemiotics is a wonderful framework to provide it.

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Tales of semiotic freedom

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Do we have the means to *clearly* explain biosemiotics to the general public? Reaching broader audiences is not only feasible, but also a responsible step if biosemiotics aims at changing the classic way biology is understood in other disciplines. We are, though, a long way from conveying our terminology in accessible and timely ways outside of our own academic journals.

Interestingly, central biosemiotic topics have been already raised in serious media outlets. Take for instance *Aeon Magazine*'s mention of Jesper Hoffmeyer's concept of scaffolding in the context of biodiversity; and Jakob von Uexküll's concept of umwelt to explain the origin of cognition. On a similar note, *Quanta* has covered slime mould's habituation, and *Real Science* has reported sperm whales' arbitrary codes, even if they do not necessarily label those topics as 'mycosemiotics' or 'zoosemiotics', respectively. These evidence-based narratives show that scientific accuracy and impactful storytelling can go hand in hand.

The potential to purposefully *apply* biosemiotics in everyday scientific literacy is yet to be discovered. I argue that biosemiotics has such a responsibility, specifically when it comes to clarifying some of the most amazing and puzzling natural phenomena, such as abiogenesis, convergent evolution, and mind: the 'bread and butter' of our field.

My presentation will show an example of how such 'biosemiotic storytelling' could look like. More concretely, I will tell a story about umwelt phenomenology based on the concept of "semiotic freedom" (Hoffmeyer 1996: 61). Not being the typical scholarly talk, my tale will start as follows: **"**In the murky waters of a Tanzanian creek, a platypus (*Ornithorhynchus anatinus*) is looking for lunch. "Umberto" closes his eyes and nostrils, letting the tickling sensations in his bill guide his scanning movements. The Australian monotreme relies on a multimodal coupling of 100 thousand electroreceptors and mechanoreceptors located on his bill skin. This underwater 'sixth sense' provides Umberto with tridimensional coordinates of his invertebrate snacks, even when he cannot see them.

Umberto's electroceptive 'scanner' does something far more complex than 'encoding' the position of submerged insects and crayfish. It relies on Umberto's ability to pertinently interpret surplus of meaning. On the one hand, Umberto's bill makes an abbreviation or sampling of *some* relevant aspects of the environment. And, on the other, Umberto's wits have a productive reference inasmuch they *enhance* the vividness of his sentience, augmenting his experiential Umwelt, "the phenomenal world or the self-world of the animal" (Uexküll 1992: 319).

In Tartu, Estonia, a suspicious hooded crow (*Corvus cornix*) is hiding caches inside her secret pantries and fridges. "Nicola" will episodically remember the expiration date and exact location of each buried snack, anticipating which items to retrieve first (e.g. fast-decaying worms), and which items to retrieve later (e.g. mussels and hazelnuts). Nicola's theftproof food-storing techniques developed within a social game of deception and theory of mind. Umberto, Thomas and Nicola are eye-opening examples of the intrinsic biosemiotic value of life: interpretative freedom. In the words of Jesper (*Homo sapiens*): "the most pronounced feature of organic evolution is not the creation of a multiplicity of amazing morphological structures, but the general expansion of 'semiotic freedom', that is to say the increase in richness or 'depth' of meaning that can be communicated" (Hoffmeyer 1996: 61). [*to be continued*]

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A biosemiotic approach to gender: avoiding morphological freedom

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This paper proposes a biosemiotic approach to gender. I argue that, in order for biosemiotic theory to be properly relevant for the humanities and social sciences in general, a biosemiotic discourse on gender and sexuality is needed. Also, I explain that a biosemiotic approach to gender is particularly insightful for current debates in cultural studies.

While biosemiotics studies meaning as embodied and environmental and has been recently employed in cultural criticism (Cobley 2016), it did not address gender, so far. Both gender studies and feminism have been founded and dominated by a (post)structuralist array of semiotic theories, which tend to compete with theories that take Peirce's pragmatism as foundational, such as, *par excellence*, biosemiotics. Also, the popular construal of gender as performed culturally and through behavior (Butler 1993) rests on analytical philosophy of language, which is at odds with the biosemiotic perspective (Cobley 2016).

Without overlooking the merits of established approaches in gender studies, I unfurl what a biosemiotic view entails for gender and explain the main differences between these two perspectives. To begin with, a biosemiotic approach construes gender according to how gender is involved in the construction of environments (*Umwelten*), understood as the subjective phenomenal worlds of organisms. As such, gender appears as a continuously evolving dimension of a semiotic agent. More than fluid, gender is never fixed. As from a Peircean perspective knowing subjects are never 'complete' selves, neither do they ever arrive at 'complete' versions of our gender and sexuality. Further, gender is understood to both depend on and reconfigure the affordances and semiotic competences that an organism has as its disposal in an environment. Hence, gender is conceived not only as limited by the past (natural evolution, cultural constraints) and performed in the present but also in a future-oriented interrogation of what the self may become.

I argue that a biosemiotics interrogation of gender can tackle the currently salient, difficult and controversial notion of *morphological freedom*, particularly characteristic for transhumanism (Sandberg 2013). This notion holds that, by expanding the mind through science and technology, the morphology of bodies can be rendered obsolete in regard to consciousness and the constitution of agency. While it contradicts decades of philosophy of embodiment, the notion is very difficult to attack without making controversial implications. I explain that a biosemiotic view posits that (material) forms of bodies and in environments (landscapes) play a role in the construction of gender but while still allowing for a transhuman construal of selves as becoming. From this perspective, gender is a present and open becoming towards a variety of possible futures. As such, biosemiotics can make an important step in the direction of Butler's (1993) proposal to dissolve the dichotomy of culture and materiality through the notion of *queerness*.

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Structures of Animal Utterances Seen as Aesthetics – and as Communication. Semiotic perspectives on functions of so-called animal beauty

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Due to a dramatic increase of research in ethology and zoo-communication over the last decades biosemiotics has now access to an extensive amount of empirical studies of how and why animals structure their utterances. Research on this key communicational element may focus on its physicality (as science) and/or a particular structure's quality (as aesthetics). For zoo-communicational research on utterances both are necessary. Some of these empirical studies contain detailed and rich information which should enable meta-studies of formed structures of animal utterances.

One such study is Prum (2017) suggesting that birds' plumage should, in line with Darwin's mostly rejected view, be seen as a result of an evolutionary battle between displaying, functioning as addressive temptation and as evaluative spectating of the display. He claims that a race between performing and judging has, over time, changed the game from "the survival of the fittest" to "the survival of the prettiest".

Prum's research is preferred as empirical (meta-)data for my study, not because of his "Darwinian" claim that beauty drives evolution, but for his meticulous diachronic study of feathers and plumage and for his principle discussion of the possible functions of structured form of animal utterances. Epistemologically, especially two relevant perspectives intersects in his work, an aesthetical, focusing the function of form as "beauty" and a more holistic one, where form is seen as part of (semiotic) communication in a wider sense.

I am not alone paying interest in this issue. Kull (2022) aims to make sense of animal aesthetics by an adjusted Peircean semiotics, specifically through his coined notion "perfect semiotic fitting". That beauty drives evolution Kull basically consider as false. He turns his attention to the sign-level in order to problematise the notion of beauty in nature (and culture) and suggests that semiotics is a relevant tool for problematising even animal aesthetics.

Ongstad (2019) presents a socio-semiotic framework for studies of animal utterances and life-genres ('habits'). It stresses meso-level concepts such as utterance and life-genre to enable a bridging between micro (the sign) and macro (the Umwelt). Further, it combines four semiotic levels sign, utterance, life-genre, and life-world, and further five intertwined communicational aspects, form, content, act, time, and space as well as a set of processes, such as semiosis and positioning. Such a framework should enable a discussion of the role of structured form as part of a taxon's communicational system.

I will first discuss claimed roles and functions of formed structures of birds' utterances in Prum (2017) based on the framework by contrasting an aesthetic and a communicational perspective and further search, comparatively, for compatibilities between the semiotic perspectives of Kull (2022) and of Ongstad (2019).

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Wonder and embodiment: On Hoffmeyer's biosemiotic aesthetics

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Among the many ideas earmarked for ongoing development in Jesper Hoffmeyer's oeuvre, his sketches of a biosemiotic aesthetics are among the most promising for dispelling pernicious illusions of alienation between human consciousness and the natural world and for healing the untold trauma these illusions have caused. Building on ideas from C. S. Peirce, John Deely, Mary Douglas, Kalevi Kull, Mark Johnson, and others (esp., Weber 2016), I focus on three themes in Hoffmeyer's writings related to biosemiotic aesthetics (esp., 1997, 2008): (1) his discussions of the interrelationships between aesthetics and ethics, (2) his treatment of consciousness as narrative and spatial interpretation, and (3) his embrace of fallibility and ambiguity as necessary for the emergence of signs of meaning in the universe. In doing so, I suggest that wonder and embodiment are key unifying relations between these three themes, with a special emphasis on the lived feelings of bodily movement and memory schemas in relation to the earth. To better illustrate the pragmatic power of these ideas, I then shift to cognitive poetic analyses of four brief passages of literary art concerned with the ethics and aesthetics of human relationships to the biological world. These four passages (by Cameron Awkward-Rich, Edna St. Vincent Millay, Herman Melville, and Cormac McCarthy, respectively) illustrate ways in which movement schemas of the human Umwelt oriented to the bodily midlines of upright posture are well-suited for rehabilitating attention to an ethical aesthetics of empathic wonder capable of retrieving a vital sense of continuity with life itself, including a spontaneous sense of concern for its irreplaceability. Revitalizing attention to these layers of being is a necessary but neglected component of the regimen required for healing the trauma of induced alienation between modern modes of human consciousness and the natural world.

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Extending Biosemiotics

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The Extended Evolutionary Synthesis also extends the role of biosemiotics. This paper will seek to extend it further, both to the metaphysics of C. S. Peirce and A. N Whitehead and to Ingold's treatment of inheritance (Ingold, 2022).

Firstness, experience without reaction, is fundamental to Peirce's metaphysics, giving qualia an ontological status equivalent to matter. Thus his broader concepts, such as tychism and synechism, are actually aspects of panpsychism. By bringing Peirce and von Uexküll together, biosemiotics restores meaning, and hence subjectivity, to biology. This paper will propose to move beyond biology to a more universal view of subjectivity.

At first sight it might appear that Hoffmeyer agrees, since he notes "This world is full of subjects and something must have created them." (Hoffmeyer, 1996, page 57). However, he stops short of panpsychism and takes subjectivity to be something that emerges with an evolutionary increase in semiotic freedom.

But to say that evolution proceeds without subjectivity and then at some point it just emerges is hardly an explanation. If evolution is accompanied by an *increase* in subjectivity, there must have been some there to start with. It is more parsimonious to claim that subjectivity occurs universally to a greater or lesser extent.

This paper will suggest that taking this view offers an opportunity to extend biosemiotics, not only towards metaphysics but also towards Ingold's radical view of evolution itself, in which ecology is central. Further, it will propose that this will make biosemiotics more relevant to the ecological crisis facing us all (Pickering, 2023).

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The Ontological Primacy of Umwelt

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Individuation – the genesis of individual entities – is generally presumed to begin with the ontology of already constituted individuals. Thus claims Gilbert Simondon. Rather than describing the appearance of individual beings from something pre-individual, the analysis of the appearance of concrete entities usually concerns itself with the appearance of composites, in which ontological privilege is given to the already constituted individuals. Is this the case with Umwelt theory as well? A straightforward conception of umwelts would treat them as a composites of organism and environment, and the emphasis is then on their mutual co-constitution through functional cycles. But does this not already assume the pre-constitution of both environments and organisms? If so, another question could be asked: what is the origin and genesis of organisms and environments which are now, as if after the fact, to be indivisibly united once again by means of functional cycles? In an admittedly speculative vein, and with the help of a certain resonance between the concepts of transaction, individuation and schismogenesis, the presentation attempts to propose that rather than organisms and environments, it is the umwelt which is ontologically primary, and that it is the internal division, separation and individuation within umwelts which gives rise to the appearance of organisms together with their environments.

Protein language models and the semiotic language of Signal Peptides

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Are language models learning to read the language of nature? This communication explores the learning potential of applying automated methods to predict signal peptides using protein language models. Signal Peptides (SP) are short amino acid sequences whose function is to guide its protein towards the secretory pathway in a cell. Being non-stable parts of proteins, signal peptides are difficult to identify experimentally. One approach to identify SP bioinformatically is to use Protein Language Models which are inspired by Natural Language Processing (NLP) algorithms (SignalP 6.0, Teufel et al. 2022). In this context, we inquire: What is the role of the computer (language) model in our knowledge about signal peptides? To investigate this question, we will propose a semiotic analysis of protein language, inquiring the extent to which language models are able to read bits of 'the language of nature'. Our hypothesis **(H1)** is that the semiotic concept of *dicisign*, or *natural proposition* (Stjernfelt 2014), understood as a kind of sign which conveys information, can shed light on the SP phenomenon. Peirce presented the dicisign as a double-sign structure by the colocalization between an Icon and an Index (Peirce CP 2.312, 1903). The iconic part of a dicisign embodies the possible properties that can be attributed to the sign's object, being its description. The indexical part of the dicisign indicates possible objects of attribution, being the reference of its object. The function of a dicisign is to inform, to convey the form of its object by its own abilities, in order to generate new interpretants which claim that the icon-index syntax holds. The SP, viewed as a dicisign, can be understood as playing a *zipcode* function: it guides a given package (icon/protein) to a certain location (index/transmembrane or outside the cell), conveying the form of its object (protein translocation). Within this framework, we will discuss the extent to which Signal Peptides can be considered as part of semiosis in order to investigate which semiotic aspects of SP can be 'translated' (or digitalized) to be analyzed through language models (we will even pose this question to another language model). Finally, we invite the audience to reflect upon the extent to which a biosemiotic approach to SPs plays a relevant role as a source of new knowledge in the growing automation of scientific practice.

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Vis-à-vis: Signification does not necessitate any kind of backward causation

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The following presentation will argue that no account of signification—be it semantic, semiotic or organic—requires appealing to backward causation.

John Deely's views on the relevance of *vis a prospecto* and *vis a tergo* as well as their connection to sign virtuality are ontologically expensive as a result of a framework that calls for other specific features to make signification actual.

I will argue here that signification is, on the contrary, a parsimonious phenomenon, metaphysically speaking, and that accounts of backwards causation build instead a kind of explanation of the metarelations of signification that does not map to actual significative relations.

Symbolic Concepts and Physicality

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In this paper, I will address four aspects of physicality as they relate to symbolic concepts: science and symbolic concepts, entropy, self-organization, and biological energy.

I have suggested that certain concepts do not have exclusively physical referents. They refer to concepts that lack mass, energy, and observability, but nevertheless, they maintain one characteristic of physicality (ie, causal effects). Such symbolic concepts include democracy, agency, law, defense, absurdity, consciousness, happiness, rigidity, truth, grounding, reference, science, meaning, hate, physicality, mental concepts, mind, information.

SCIENCE AND SYMBOLIC CONCEPTS. It is interesting to note that in much of scientific discourse, the concept "abstract" is entirely acceptable, but the concept "nonphysical" is taboo. But often the very definitions of "abstract" indicate that such concepts lack physicality (eg, "Abstract thinking is the ability to understand concepts that are real, such as freedom or vulnerability, but are not directly tied to concrete physical objects and experiences" (Joy, R., 2019). Could it be the case that, within the context of a scientific endeavor, there is a tendency to assume that the concepts reference physical entities? In other words, do we assume that if we are doing science, we are examining the physical world? Have we implicitly modeled the world such that we expect all concepts to refer to material entities?

ENTROPY. Entropy is generally seen as a tendency for dissipation, decrease/loss of energy through work. Symbolic concepts might be seen as entropic phenomena (lexical/conceptual entropy) from several perspectives. Symbolic concepts get their meaning from other words with related meanings and are therefore difficult to define. They have multiple meanings and therefore their referents can be difficult to predict and thus interpret. As a result, they produce uncertainty. Their meanings can change over time, and they may be difficult if not impossible to translate into another language. Average entropy measures average information, and thus it is a measurement of uncertainty (Solms, 2021, p.157). As applied to the physicality issue addressed here, we might argue that the more definitions and synonyms that a particular concept carries, the greater the entropy, the uncertainty, and the predictability of the meaning of a concept in a particular context.

SELF ORGANIZATION. Could symbolic concepts be, in some way, self-organizing phenomena? Could the fact that they lack mass, energy, observability make them essentially open to several meanings by having iconic features that allow them to be considered similar or identical to other concepts. Their quasi-physicality makes them abstract and therefore, to a significant extent, liberates them from the strictly physical world.

BIOLOGICAL ENERGY. In a discussion of the biological phenomenon of arousal, Pfaff (2005) says "satisfying the need for an 'energy source' for behavior, arousal explains the initiation and persistence of motivated behavior in a wide variety of species... a concept like arousal is necessary to explain the initiation, strength, and persistence of behavioral responses."

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Semiotics of potential meanings

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Because semiosis is coextensive with living and life-dependent semiotic agents, meanings (relations of entities to something else that is significant for agents) exist only on condition that semiotic agency exists capable of using/interpreting them. However, meanings can be actual or potential, depending on whether they are interpreted by semiotic agents at the given time, or not interpreted, respectively. An example of potential meaning is a natural resource (or its feature) that initially has not been utilized by organisms because of the lack of either sense organs or 'knowledge' of how to do it. Later, when agents gained access to this resource by adaptive evolution and/or by learning, potential meaning turns into actual meaning.

Because intrinsic properties of resources remain the same before and after actualization, it makes sense to consider such potential meanings existing even before they become actual, but retrospectively. Physics describes potentiality as a field that can be measured at any point in space by an appropriate device. Thus, I suggest treating potential meaning as a semiotic field that can be measured by some competent semiotic agent if it is placed near the meaning carrier (which is a potential sign). By observing the activity of the agent (e.g., living cell) we can simultaneously detect the existence of meaning that was in a potential state before the experiment, and the capacity of the agent to respond. Thus, the ontology of meanings is agency-dependent and knowledge-dependent. Meaning is subjective when initially discovered, but it can spread via communication and become objective within the community of agents. The collective knowledge is updated with the emergence of each new kind of agency: first, actual meanings are updated in space-and-time proximity of these new agents, and second, potential meanings are updated in the whole universe, as well as in the reconstructed past, and in the projected future.

Retrospectively, the origin of life can be explained as a transition of some pre-existing potential meanings (e.g., resources and catalysts) into actual meanings that acquire goal-directedness via collective mutual support and propagation. Thus, life most likely emerged in complex micro-environments enriched in non-redundant potential meanings. Following Deely, I assume that such complex environments can ignite the origin of life or provide resources for already existing life. Evolution of living organisms continued actualization of some already existing potential meanings, and these actualized natural meanings together with new artificial meanings became encoded in hereditary signs and memory for the purpose of reusing them when necessary within the lifespan and beyond (in the progeny). Memory in organisms is a repository of potential meanings (i.e., passive memory units that can be activated to communicate their meaning) that enables organisms to adapt on demand by activating interpretation of these potential meanings.

The thresholds for extending the evolutionary synthesis: How far can we go?

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The research project "Methodological design of extended evolutionary synthesis: interdisciplinary framework for social and life sciences" (Russian Science Foundation, № 22-18-00383) faces the challenges of crossing interfaces between traditional scientific disciplines, paradigms (in Kuhn's sense), research programmes (in Lakatos' sense) and even subtler exploratory projects. Our point of departure is the need to fully utilize the potential of interpretation and thus of semiotics with its interpretant as the utmost noumenal instance of cognition. It seems promising to move top-down through the layers of scientific knowledge from the humanities and social sciences towards the life sciences and further to chemistry and physics as well as to quantum mechanics and cosmology with its string theories, etc. However adventurous this idea may seem, the Anthropic Principle in any of its versions implies that interpretation along with observation, calculus and patterning is universal and applicable to any state of the Observed (measured, shaped and interpreted) Universe or its constituents. But it is even more evident that interpretation as we use it in our everyday lives – moreover in social and human research – cannot be bluntly applied to study of life forms or molecules or galaxies. We all know about fallacies of anthropomorphism and other obvious cognitive restrictions and methodological censures.

We also know that although Kantian antinomies cannot be resolved once and for good, our human cognitive capacities to conclude (Urteilskäfte) allow us to find here and now pragmatic and palliative solutions. Such solutions inherently are specific and not universal. But consistent exploring of their systematic series and sequences may allow us to disclose transitory forms as well as their pragmatic and palliative mutual interaction. Typically cases and instances reveal themselves on the interfaces or thresholds between domains of our Observable Universe or thresholds of human cognition and scientific investigation.

The much-discussed biosemiotic threshold is a typical case of this. Different authors and schools of thought debate if interpreting and coding stay on different sides of the divide or on the opposing banks of Rubicon, or mingle on the threshold created by the overlapping of distinctly different domains dominated either by coding alone or coding with interpreting. The paper suggests we should go further and explore a series of far-fetching reductions of interpreting and coding. This series may include copying (making an alternative sample of the original), reproducing (making another instance of something which is separate and selfsame), and finally pulsating (reappearing again and again). All those distinctly different forms can be related to each other by the usage of a common operational scheme: recursion with inversion or rather recursion with an inverse switch.

The research was supported by the Russian Science Foundation, project № 22-18-00383 "Methodological design of extended evolutionary synthesis: interdisciplinary framework for social and life sciences" at INION RAN

Peirce's ideas of the man-animal distinction

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Peirce was an evolutionist and one of the first to generalize the concept of evolution from biology to physics and sociology alike. He also took some interest in locating what it is that separates the human animal from other higher animals. As to biological instinct, it was the human urge to externalize signs in art, technology and science and other products of the *extended mind*; semiotically, it was the ability to make *hypostatic abstractions*; psychologically, it was the notion of extended *self-control.* This paper revisits Peirce's conceptions of the human condition. Peirce ascribed humanity great tasks in the evolution of the planet as of the universe; yet, his evaluation of the individual human animal was very low, as to autonomy, courage, moral, as well as intelligence. By which means did he think this chasm between the individual human animal and the grand aims of humanity could be bridged?

A biosemiotic perspective on the human condition & the environmental crisis

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In this presentation I will present the book chapter "A biosemiotic perspective on the human condition and the environmental crisis" (Tønnessen, forthcoming). The chapter presents a biosemiotic perspective on the basic situation for human beings and that of other organisms, with an emphasis on the subjective experience of sentient animals, and the sign use of all lifeforms. The human condition is portrayed as traditionally conceived, and then revisited in the new context of the current environmental crisis. In recent decades, the expression 'The Human Condition' has been strongly associated with the political philosopher Hannah Arendt (1906–1975). In her book with the same name (Arendt 1958), she stresses that "[t]he earth is the very quintessence of the human condition", and yet argues that "the "human artifice of the world separates human existence from all mere animal environment".

In this sense, in her view, human reality is distinguished from the reality of any other living being on Earth, despite our shared ecological circumstances. A cornerstone of the chapter is an analysis of the materiality of the environmental crisis, and how the massive changes humans have caused in the physical environment can be understood in light of the semiotic agency of humans and other living beings. Experiential aspects of the environmental crisis are highlighted. The aim of the chapter is to improve our understanding of our species´ place in the natural world, our historical role in causing a global crisis for life, and how we can move forward towards a more sustainable future.

As Masatake Shinohara (2020) has proposed, "what conditions human beings in the most fundamental sense includes not only the world of the human artifact but also the world of earthly things", and in light of this, "the consideration of the human condition should be fundamentally reformulated" by making the human world "open to the earthly things that vastly expand outside of the human artifice".

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An attempt at a semiotic approach to animal play and joking

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Play in the animal kingdom is an extremely widespread phenomenon, most studied in higher vertebrates (birds and mammals), but clearly existing in the behavior of reptiles and fish, possibly even arachnids and insects. Definitely in cephalopods, chiefly octopuses.

The phenomenon of animal play is extremely multifarious and multilayer, so its definition is subject to many difficulties. In this paper, I attempt to use the definition proposed by Bekoff and Byers: "Play is all motor activity performed postnatally that appears to be purposeless, in which motor patterns from other contexts may often be used in modified forms and altered temporal sequences. If the activity is directed toward another living being, it is called social play." (*Animal Play: Evolutionary, Comparative, and Ecological Perspectives*, Bekoff M, Byers J, Ed. p. 99)

Stuart Brown, in stating that animals have an intrinsic urge to play, declares that play forms one of the basic ways for animals to gain knowledge of themselves and their environment through adaptive, flexible and pleasure-laden action. (*Ibid*, p. 254)

I must confess that I'm not very happy with the use of the term "purposeless" for I am convinced that animals (vertebrates at least) have an intrinsic need to have fun or, dare I say, the need to leave and get impressions, in accordance with which I propose a definition of the signs of involvement as perceptible traits of animal activity indicating that the animal's attention is purposefully engaged and targeted in a certain behavioral context.

This approach opens up a field of study of swift and extremely targeted signs in animal play. We know very well that young animals play with all manner of objects in all manner of circumstances in display of practically all major forms of behavior, such as sexual, social, defensive, parental, comfort etc. Whereas playing with living creatures, in terms of both intra- and interspecies contacts, animals use very specific signs designating the situation strictly as play. Most-studied examples include the canine "bow" as an invitation to play, ravens' *khrr-klack* sound as an invitation for a play flight etc.

In my experience, different species of animals, especially in post-childhood and adult life, develop a special kind of play, which seems to me as playing with situations of play. An animal engaged in such activity holds back the specific "play" sign, starting a detailed imitation of a sexual advance or attack, dominance etc. but immediately displaying the previously omitted "play" sign at the first hint of the adversary exhibiting the proper reaction to the non-play activity.

This I would describe as "joking" between animals. Joking of this kind is easily observable in the behavior of apes, monkeys but also bears, canids, felines, Corvidae and parrots. It seems to me that in animal play, and especially in jocular play, enhanced possibilities of mutagenesis in memes takes place. Therefore, it could be very interesting in the study of the evolution of signs.

An ecosemiotic approach to urban wildlife photography as translation of solastalgia

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In line with the recent biosemiotic approaches to Translation Studies (Marais, 2019), this paper is an attempt to conceptualise urban wildlife photography as part of an intersemiotic translation process by re-examining the photographer as a translator who acts as an ecological mediator between non-humans animals and the humans who share the urban space.

After first situating the study as a semiotically framed translation study this paper delves into Water Benjamin's analysis of photography as capturing a moment of knowledge and aligns the discussion with the loss of place and belonging experienced by non-human animals in urban ecologies. As such it intends to ecosemiotically explore the post-anthropocentric role of urban wildlife photography in the Neganthropocene (Stiegler, 2018). It will do so firstly as a "transvaluation of all values" (Steigler 2018, 38; 67; 209) and, by extension, a translation of solastalgia. Originally defined as "distress that is produced by environmental change impacting on people while they are directly connected to their home environment" (Albrecht et al. 2007; 2019), solastalgia, it is argued in this paper, should be extended to include the experience of the non-human as well. In other words, existential distress of the non-human should be re-evaluated according to a non-anthropocentric biocentric normative framework in order to be able to provide a non-elitist critique of ecological destruction in urban areas. Photography of the wildlife that share our urban spaces, it is argued here, is one way in which this experience can be critically depicted and translated to a human audience. By means of an interdisciplinary discussion between Translation Studies, Semiotics, and Critical Theory, we attempt to explore the conceptual grounding of urban wildlife photography as intersemiotic translation.

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The Signifier's Objects: A Temporal Phenomenology through Lacan & Uexküll

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The connection between Biosemiotics and Phenomenology is natural and necessary. Uexküllian thought, since the time of Heidegger, has pollenated profound philosophical insights into the nature of human and non-human worlds, and in return, traditional biosemiotics has held a crucial foothold in phenomenological thought. Without critical phenomenology, biosemiotics is threatened with a materialist stagnation; without biosemiotics, phenomenology risks a spiraling self-gratification into idealism. It is my opinion that current trends show symptoms of this mutually becoming the case. A tradition heretofore only minimally engaged by current biosemiotics is that of French psychoanalysis, particularly that of the Lacanian school. When considering the profound theoretical influence of Uexküll and mid-century ethology on Lacan's thought, as well as the devastating critiques levelled by the Lacanian school against French existentialist, Heideggerian, and Husserlian phenomenology, it is a wincing mistake as biosemioticians to have passed over this episteme for so long.

Through a critical reading of Lacan's seminar IV, *The Object Relation*, I will follow in Lacan's footsteps by proposing a theory of experiential objects that are constituted not by a Husserlian ego, but by the unfolding of a particular 'signifier'. In a basically autopoietic move, Lacan's notion of objects, as they are constituted in a growing subject, serve to orient and disclose the subject's lived reality within a particular mythological structure; the particular object *qua fixed object* is a *point de capiton* in the autopoietic myth. In this unfolding of the signifier-myth, objects appear as fetishistic or phobic fixities that answer to the subject's developmental anxieties. Such objects can then become the infamous *objet a* of Lacanian theory; the object of desire, ever pursued and necessarily deferred. As has been shown and will be shown again, however, both by Lacan's review of psychoanalytic case studies and some of his most crucial writings, the object-statuses granted by the developing myth exist within a degree of substitutivity and arbitrariness. The object of desire is *primarily a function of the mythical developmental signifier*, and *not* an object in-itself. Experiential objectivity to Lacan, then, is derivative of a *basically diachronic process,* an objectivity determined by orientation and approach rather than some essential qualitative characteristic. In his seminar IV, this was explored in the phobias that appear around the Oedipus myth of Freud's *Little Hans* case study, and primarily concerns a societal negotiation of phallic stimulus. It is very interesting, therefore, to notice that a strikingly analogous diachronic unfolding of signifiers may be observed in Uexküll's notion of the 'functional cycle'. In his famous example of the Tick, three stages of significant operations must be passed through to complete the tick's feeding functions; light, sweat, and warmth, each with a functional encoding. Here, the experiential 'objects' of the tick, that is, its perceptual cues, necessarily imply the completion of one functional cycle and the procession to a new, discrete one; sweat is not simply the tick's impulse to drop from its grass, but also the *diachronic implication* of feeding-to-come. To put it simply, the action of the tick may be a strictly coded physiological response (smell → drop), but carries the necessary implication of a particular response, namely, the possibility or impossibility of feeding upon what it lands. With such an understanding of objects as *fundamentally diachronic*, I hope to propose a new phenomenology that can appraise the constitution of signifiers and signifier-elements, the very *bauplan* of humans and animals, which deviates significantly from phenomenological monism as equally as popular contemporary metaphor-absolutism of the cognitive sciences.

Meaningfulness and applicability of semiotic concepts in biosemiotics

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The 1st Gatherings in biosemiotics was held 22 years ago in Copenhagen and the first sentence of its CFP proclaimed the intention "to establish a regular framework for discussions of biosemiotics in the context of biology". I must have been taken that seriously, because without being biologist at all, my talk was titled "How and why to naturalize semiotic concepts for biosemiotics?", i.e. how semiotic concepts of human, mental, logical, and linguistic sciences might be applicable in the natural science of biology (Vehkavaara 2002). Eight years later, the sixth of the so-called Saka-theses (Kull *et al.* 2009) proclaimed "(b)iosemiotics does not take for granted the wide variety of concepts of the sign, sign action, and so on [...] but undogmatically sees these as a resource for the construction of an up-to-date, refined, and better-grounded [...] version of a general semiotics" (p. 170). The question is the same as my talk in 1st Gatherings. One of the many difficulties in this is the integration of conceptual and empirical studies. Often in empirical studies, the phenomena are dealt with standard biological manners, and the semiotic concepts either play a rather thin and decorative role, or are referred only in some vague intuitive senses. Theoretical studies, in turn, easily stuck into debates between competing abstract definitions without criteria specific enough to control their applicability. Some of the theoreticians start from a kind of foundational and universalistic semiotic metaphysics or transcendental philosophy (seemingly e.g. Søren Brier, John Deely, Kalevi Kull, and Thure von Uexküll) that is supposed to replace more standard non-semiotic naturalism. Others take the opposite strategy and start from standard physical theory but aim to end up showing how semiotic concepts emerge or become possible as the complexity of physico-chemical systems increases (e.g. Deacon 2013, Short 2007, Bickhard 1998, and to some extent Hoffmeyer 1993). This last strategy may nevertheless be too consuming for more concrete studies, and therefore perhaps some antifoundationalist and pluralist naturalism would be more preferable. In these biosemiotic approaches, it would be accurate to consider on which grounds and how the theoretical starting points are chosen?

In empirical studies, the choice appears often as rather random, but it is implicitly present even in the naturalistic strategy of Deacon and others, because some preliminary idea about signhood or meaningfulness is after all required. Be the starting points some already developed semiotic conceptions or merely intuitive ideas, we should pay attention to the semiotic phenomena that we use as exemplary prototypes for the used or constructed concepts of sign, meaning, etc. Of the already established semiotic theories and conceptions applied in biosemiotic studies, several motivating problems and starting point intuitions can be listed: (1) subjectively meaningful perception (e.g. Uexküll, Husserl, and Sonesson), (2) socially shared mental ideas (e.g. Saussure and structuralists, Lotman, and later Wittgenstein), (3) representational cognition of rational inquiry (Peirce and Dewey), (4) mechanical action or correspondence (e.g. Barbieri's cry "meaning is a molecule!", protosign of Sharov 2015, and possibly Morris' behaviorism), (5) intentional or teleological action (e.g. Alexander 2013, constructive representation of Vehkavaara 2003, and minimal ontological representation of Bickhard 1998). These differing starting points produce the differently structured and functioning concepts of sign or meaning. I would take it unlikely that any single concept of sign or *semiosis* could be sufficient to describe all biosemiotic processes and be somehow self-evidently universally applicable. It is also possible that in many cases more than one differently structured signs functions together.

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Danger Modeling: Meaning-generation in Three Dimensions

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In the struggle for existence, any known species of organisms must avert danger to ensure survival. To do that, they need to identify—or model—it in ways that are specific to their species and actualized in concrete situations. This is an act of generating meaning that falls perfectly within the purview of biosemiotics. The present chapter uses human danger modeling as a case in point to discuss meaning-generation in the biosemiotic context. The rationale is a three-fold one. Firstly, the study of danger, understood in the aspect of meaning-generation, makes an example of semiotic analysis, because warning signs are among the most primordial and relevant vehicles for meaning. Secondly, the Sebeokian concept of modeling serves as a useful tool to tackle this problem. The reason is that the concept underscores semiotic agency and promises to be a highly integrative framework for studying meaning-generation. Thirdly, humans have evolved into such complex superorganisms that we not only live by existential modeling and semiotic modeling at same time but also deeply entangled in our own semiotic webs while probing into and creating possibilities of new meanings. This threefold rationale underlines the need for a comprehensive approach that considers meaning-generation as actualized in different dimensions. This chapter identifies three such dimensions, namely, the representational, interpretational, and existential dimension. These three dimensions form a system that corresponds roughly to the Peircean triad of semiosis.

Discursivity and semiotic complexity as driving the shape of animal choice and human freedom

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Biosemiotics, it seems, holds the key not only to understanding life but also to one of the more intractable issues that has been bewildering philosophy for a long while – the question of freedom. If we are to try and reconcile the possibility of free choice with biological facts, we ought to explain how biochemically constructed beings, subject to biological and thus ultimately physical causality, can be capable of choosing between alternatives, not randomly but deliberately, as random choice can hardly qualify as meaningful control of an organism over itself. Moreover, we will have to explain it while taking into consideration both the diversity of life on Earth and its evolutionary development. I will argue that Hoffmeyer, when he attached the name of *semiotic freedom* to the semiotic complexity that reflects "the depth of meaning communicated or interpreted by living systems," is hinting at an important dependency: the degree of freedom is determined by the organism's capacity to communicate and interpret more complex indicators (Hoffmeyer, 2010). In the conception of freedom I will be advocating, the capacity for choice is potentially present in all life and is realized when an organism becomes capable of both acting in the world and representing alternatives to its own consciousness, or achieving a certain level of Hoffmeyer's semiotic complexity. The scope of freedom here is determined by the organism's *Umwelt*. Yet, when discursive meta-cognition appears, the *Umwelt* becomes vastly more dynamic, subject more to the limits imposed by the human organism's own intent rather than merely to the boundaries defined by physiology. This is no simple supervenience: the choices we make consciously alter the boundaries of our semiosphere, as do the choices others make. This changes the semiotic dynamics of freedom and makes it a very interesting research subject with implications that go beyond individual and all the way to educational and other policies, as I will try to suggest.

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Ecosemiotics between matter and life: starting from John Deely's interpretation of semiotic scaffolding

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The presentation is an extension of the arguments proposed by John Deely in his article "Building a Scaffold: Semiosis in Nature and Culture", published in 2015 in the journal *Biosemiotics*. In particular, the idea that physical scaffolding prepares the plans for the advent of organic life will be extended. In this sense, Deely suggests that there is a semio-material support that serves as a condition and direction for the «erection of a scaffolding moving the lifeless universe in the direction of being able to support life» (349). His theoretical hypothesis seeks to show how semiosis could extend beyond life, onto a physical universe that determines the conditions of possibility for the emergence of organisms. Thus, semiogenesis, if it is possible to speak of genesis, could be sought in its material dimensions. This somehow seems to propose a counter-proposal regarding the premises of biosemiotics, that life and semiosis are co-extensive.

The argumentation will consist of three parts: firstly, Deely's arguments proposed in the article will be briefly summarised, emphasizing the thesis that semiosis extends beyond life; secondly, a dialogue between biosemiotics and physiosemiotics will be proposed through an ecosemiotic reinterpretation that integrates the material plane into the semiosis of nature; finally, thanks to the notion of semiotic scaffolding, a resemantization of physiosemiotics will be presented, embedding it in the study of ecosystemic semiotics.

The aim of the talk is to link Deely's argument, which is posited from a physiosemiotic point of view, with contemporary advances in biosemiotics. From this perspective, we can read Deely's proposal in syntony with biosemiotics, using ecosemiotics as a tool to harmoniously integrate the two discourses. In fact, if we think of ecosemiotics through a holistic perspective, we can combine the biotic and the abiotic, the organic and the inorganic, nature and culture, life and non-life through a continuity that stands on the semiotic scaffolding. Taking Deely's proposal about the materiality of the scaffolding preparing life seriously, it could be understood as the material structure that brings forth the process that directs the signifying relations between life and matter. In Deely's reinterpretation, semiotic scaffolding can be understood as a structure that offers evolutionary directions to organisms and the relationships between them from an ecosystemic and material point of view. The scaffolding in an ecosystem can be interpreted as the planes in which organic and inorganic life meet and condition each other.

Finally, a reinterpretation of physiosemiosis from ecosemiotics will be proposed, resemantising the notion of "Physis", in the Greek sense of the term, i.e. nature in its whole. The semiotic scaffold can be a useful framework for making life and non-life dialogue through complicity and continuity, showing the intricate semiotic network and its processes, in a first and fundamental reality. Physiosemiotics, from an ecosemiotic perspective, can be seen as the structure of the semiotic scaffolding that makes ecosystemic organizations emerge.

More constraints, more freedom: Revisiting semiotic scaffolding, semiotic freedom, and semiotic emergence

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Technically, constraint is defined as the reduction of degree of freedom. However, novelties emerge in dynamic systems with constraints. Constraints make once almost impossible states become possible. That is, constraint may raise the probability of the actual realization of possible states once being only possible but having rare chance to actually realize. When a dynamic system stabilizes to a state with certain constraints, it provides a scaffolding for new possibilities at higher level. Therefore, Emergence of novelties at a higher level is possible. We may say, more constraints create more freedom.

This way of understanding dynamic emergence may also help us further understand Jesper Hoffmeyer's seminal works on semiotic scaffolding, semiotic freedom, and semiotic emergence. Semiotic scaffolding makes semiotic freedom of living systems possible. As Hoffmeyer (2015) argues,

> "*Yet, this particular strategy potentially ignites a self-perpetuating evolutionary dynamics, since each step taken by a species along this route potentially opens new agendas for further change: the more capable some species are of anticipating and interpreting complex and fast changing situations or events, the more will evolution favor the development in other species of a well-adjusted set of semiotic tools.*"

In the presentation, I will take Terrence Deacon's work on the origin of life and therefore of semiosis as an example to show how semiotic scaffolding and semiotic emergence can be understood in terms of the dialectics of constraint and freedom. This understanding indicates that semiotics emergence is a dynamic emergence which is a kind of weak emergence rather than strong ones. It also brings new insight to reconsider the epistemic cut.

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A view on abstract concepts from an interaction-based perspective: An attempt at a semiotic analysis

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Most of the approaches to concepts, both in cognitive science and in artificial intelligence, are informed by information-processing views. Concepts are mapped to categories, which despite their fuzzy boundaries, graded structure and family resemblance (Rosch, 1973), are still mostly characterized by objective features pertaining to the objects in those categories. This has not changed even in the newest deep learning models, when those features are not translatable to straightforward descriptions but still objectively belong to the classified objects.

Yet in "action-first" or interactive modern paradigms, such as ecological psychology and enactivism, perception and action are inseparable, and the world is perceived in terms of relational features, affordances. This relational view puts center-stage the first-person experience, including experience of one's own movement and agency (Sheets-Johnston, 2011), often in interaction with others, which makes the theory of concepts deeply embodied, situated, naturally interactive and normative (Rączaszek-Leonardi & Zubek, 2023). Such a view on concepts facilitates explaining their action and goal-relevance and their flexibility, however begs the question about the processes of abstraction from the immediate contact with the world.

In our paper we will attempt to trace how the abstraction processes could look like, and we envision them as particular historical and social paths of agents' experience with the world. Following William James, we will treat emergent knowledge structures as selection capabilities developed as skills in dealing with and making sense of the world. By attempting a semiotic analysis of this process, we hope to shed light on a variety of possible trajectories of concepts acquisition. We will treat signs as constraints allowing selection between alternative concepts. As we will argue, acquisition of a certain concept can be equated with the ability to interpret a sign leading to the selection of that concept. Apparently the same concept can be elicited by multiple signs, possibly belonging to different classes (iconic, indexical or symbolic). Congruently, individual trajectories of acquiring a concept may vary and involve different semiotic processes. We will analyze the classic distinction between concrete and abstract concepts in the light of Peircean semiotic categories, starting with firstness, secondness and thirdness. The necessity of social interaction in establishing even the most concrete concepts using the most basic signs will be discussed.

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