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Subject and Aesthetic Interface - an inquiry into transformed subjectivities

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Subject and Aesthetic Interface – an inquiry into transformed subjectivities

By

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Abstract: The present PhD-thesis seeks new definitions of human subjectivity in an age of technoscience and a networked, globalized, Information Society. The perspective presented relates to Philosophy of Science, which includes the Human, the Natural, the Social and the Life Sciences. The project is directed at addressing, and aims to participate in, the further development of Philosophy of Science, or rather, the philosophy of knowing, which leaves a perspective broader than that of science. Methodologically, I combine readings of technoetic artworks, which I approach from a hermeneutical-semiotic perspective, with transdisciplinary research into existing theory concerning the human subject. These readings form my case studies. I keep a particular focus on holistic biophysics (Mae Wan Ho, James Oschman, Marko Bischof). Furthermore, Søren Brier's cybersemiotic theory of communication, cognition and consciousness, which combines a cybernetic-autopoietic and a Peircean semiotic perspective, plays a central role in the project.

The project has three parts. Part one contextualizes the study within philosophy of science. It discusses relevant epistemologies, and places the case studies in an art categorical context. It further discusses the philosophical problems involved in writing an academic thesis in the form of a linear, argumentative, critical style, and how it affects the process of meaning making in a way that has consequences to my research. The second part consists of four case studies, each under an overall theme, which applies to the question of human subjectivity. Here I build the concept *Extended Sentience*, and the concept of an *Ideal User*. The Ideal User functions as a conceptual frame, which allows me to gradually add more elements to a theory of an altered human subject and knower. The third part presents new ontologies under three basic themes: *Time and Relativity*, *The Life Cycles of Metaphors*, and *Logos Philosophy and Virtual Grids*. These ontologies strongly affect ways of interpretation made in part one and two. Part Three allows more space to my subjective thought processes, which will take

precedence over the literature applied. Thus, I, as a post-objective subject observer, will become more transparent. Finally, I will seek an overall conclusion to the project, which should clarify areas where it is evident that the human subject must be reconsidered at a pre-scientific level. It is my thesis that the foundation for human knowledge generation is changing drastically today, and that it has become crucial to reconsider a common understanding of what constitutes the human knower.

List of figures and illustrative images:

To my parents Peter Munk Anker and Lene Anker,

To my sister, Charlotte Anker, her husband Brian

their sons, Sebastian, Simon and Silas,

To my sons, Alexander Nikolaj Anker Markovic and

Nicolas Stefan Anker Markovic

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I have also been grateful for the open and generous Phd-policy in my country, Denmark, which has allowed me to attend a diversity of conferences across disciplines, which has given me the opportunity to gain insight of current movements within the respective scientific fields today.

I will end my acknowledgements by thanking Birgitte Breving Christoffersen (www.dakinihealing.dk) for the possibility to attend activities that involve healing methods and non-technological energy work, which have given me a valuable phenomenological background for the philosophical, academic and scholarly approach to the body, all of which I have combined in my work at the Planetary Collegium.

AUTHORS DECLARATION

At not time during the registration for the degree of Doctor of Philosophy has the author been registered for any other University award without prior agreement of the Graduate Committee.

Publications related to this thesis, relevant scientific seminars and conferences regularly attended are listed in Appendix 2.

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Introduction

1.0. Thesis problem and theoretical field

This thesis presents an attempt to create philosophical formulations of the human subject in ways that can be considered relevant to scientific practice. The main question that forms the thesis problem is: *how do we know? And how can we characterise the human knower in a way that relates adequately to a contemporary and near future socio-cultural situation, where the relationship between cultural-technological developments and developments in mind, cognition and social forms is taken actively into account?*

My motivation for taking up this question lies in the fact that science, in light of second order cybernetics and quantum philosophy, and the opposing strong demand on objectivity in science in general, no longer accounts realistically for the human subject who is involved in the research process, and who produces experiments, theses, theories, and new knowledge. The inherent misconception of the human subject that often lies implicit in academic work affects the general social semantics concerning how we as human knowers understand ourselves, and our inborn abilities to know. But why has such a discrepancy occurred, and what are the problems that are necessary to take into account?

One problem concerns the current and rapid change in the identity of the human subject that has to do with the increase in technological development, which also causes questions of human evolution and the relationship between human and

technological tools to arise. Giuseppe Longo, in his article *The Epistemological Turn* (Longo, 2006), claims that the human species will continue to evolve, not physically, but culturally through information and communication technologies, where technologies are understood to alter cognition, consciousness and intersubjective behaviours. This development touches upon ways in which we understand human knowing, and demands conceptualisations that are fit with the current and near future condition. Longo's basic assumption, however, that while developing with and through a symbiosis with electronic and computational technologies, human beings as a species will not continue to develop on a physio-biological scale, does capture my attention. For how can human beings evolve cognitively without the physical structure being involved?

I do not expect cultural and technological developments to happen without causing, or even perhaps turning out as the effects of, equivalent physio-biological development and inner developments of human consciousness as such. In my view, the biggest problem lies in understanding human consciousness in relation to cultural and technological developments. In order to know more of the relation between culture, technology and the physical body, we are forced to move into further considerations of what forms the sub-conscious levels of our awareness, of our basic prerequisites for knowing.

Further from the problem of out-dated models of the human subject and versions of conscious versus sub-conscious levels of subjectivity, the problem involves questions concerning how the relation between the individual and the social level could be characterised in a time of social connectivity effectuated through information technologies and social media. So, in this equation we have three fuzzy unknowns:

cultural-technological versus biological development, the relationship between conscious and sub-conscious levels, and the point of connectivity or discrepancy between individual subject and the collective. What is particularly challenging in this project is that the implications of our theoretical explorations affect not only the way we conceptualise the human subject as a theoretical construct at a third person level. It also affects ourselves as researchers, and more profoundly: the philosopher at the first person level. The project must therefore consider both positions, and allow them to be informed by each other as a central part of the projects textual and methodological structure.

A main point of concern, in order to not let the external and contemporary advents of culture and technologies be fully determinate of our main conceptions of the human subject, is to re-acquaint the question of inner knowledge, and to ask of the relation between the spiritual, the mental and the physiological sides of the human subject in the context of this question. As a consequence of asking this question, we are forced to reconsider the role of rationality, feeling, brain/cognition and body, and to ask how these aspects of the human mind relate to processes of introspection. In order to find answers, I will seek new ways in which to define idiosyncratic levels of subjectivity, and ask how they influence upon knowledge generation, and how they can reach new levels of categorical generalization when it comes to structures of mind. As a part of this quest, a further aim is to give priority to convincing research (biosemiotics, holistic biophysics, cybersemiotics) that has not been widely accepted within their respective fields (biology, medicine and philosophy), in order to test its potential while writing new theories of the human subject

At this point, it is important to notice that by using the term science, I am not, as in the American tradition, referring to the natural sciences, but rather to the German understanding of Wissenschaft, which includes the natural and the human sciences. I will, consequently, refer to institutionalized knowledge as either *academia* or science, where academia refers to institutional conventions, and science to the actual practice, including tacit knowledge, which is understood to be involved in both formations.

The social context that defines the starting point of the thesis, but which will be further developed in the course of the project, is best described by Lars Qvortrup's Luhmann inspired idea of the hyper complex society (Qvortrup, 2003), together with Helga Nowotny, Peter Scott and Michael Gibbon's (2001) idea of the *Agora.* The Agora connotes a virtual market place, where different rationalities are taken up for negotiation. Here, science has been deprived of its role as the main source of truth, and has become but one rationality among others (politics, economy, law, religion, love, etc.) that must be negotiated on the terms of the market place, in order to gain effect at the social level. Furthermore, the social context includes information technologies (including digital screen interfaces and environments of mixed- and augmented reality), and their centrality in lifeworlds and academic institutions respectively. For this reason, contemporary artworks are understood to refer specifically and often precisely to the most central instances in the contemporary situation by bringing together references to art, technology, science and the study of consciousness in a condensed and exemplary symbolic form.

2.0. Methodology

The method presents a forward directed, creative, and integrative approach, based on transdisciplinary strategies, and the ability to economize with relevant theoretical resources across disciplines, which will allow me to construct a meta-level, cross-canonical theoretical semantic syntax.[1] The basic point of departure of the project is a process oriented approach to reality, where everything is understood to be in constant movement, and where the ability to capture the fixed point in space is understood to be the exception, rather than the rule;[2] this affects our basic ontological understanding of the research object as well as of the subject writer. The method has been inspired by a number of sources, among which are Professor of Communications, Brian Massumi's book *Parables of the Virtual* (Massumi, 2002), Holistic Physicist David Peat and Professor of Theoretical Physics, David Bohm's *Science, Order and Creativity* (Peat & Bohm, 1987), David Bohm's (1980) *Wholeness and the Implicate Order*, and Theoretical Physicist Basarab Nicolescu's (2002) *Manifesto of Transdisciplinarity*, along with John Deely's (2005) *Basics of Semiotics*, and Søren Brier's (2008) *Cybersemiotics*. Except for Deely's book, all of the mentioned theories take philosophical implications of quantum mechanics into account, while simultaneously delivering work that could be viewed as contributions to the field of Philosophy of Science.

The goal of the project is, besides from delivering an inventive contribution made through the project's very articulation, to have its formulations

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[1] By this I mean a structure of meaning on the basis of choices of including particular literature, and excluding other literature relating to the topic.

[2] This exact formulation is inspired by Massumi, 2005

further negotiated among peers in philosophy of science, and to inspire the work of contemporary technoetic artists.

The process-oriented background of the project connects culture as an emergent phenomenon with nature's emergent properties, which are viewed as mutually linked though a reciprocal influence that also has an evolutionary aspect. The human subject and society are thus understood to be in a constant state of becoming, mutually influencing upon each other, reciprocally linked. Massumi (2002), who has formulated a process oriented framework that takes the virtuality of quantum fields actively into account, has written how this perspective has consequences in how we think of method:

> 'Prolonging the thought-path of movement, as suggested here, requires that techniques of negative critique be used sparingly. The balance has to shift to *affirmative* methods: techniques, which embrace their own inventiveness and are not afraid to own up to the fact that they add (if so meagerly) to reality.' (p. 12-13).

Massumi thinks that critical argumentation through debunking seeks exclusion of reality segments, and that this methodology represents a 'basically descriptive and justificatory modus operandi' (p. 12). He thinks that not only should we adapt to the necessity of a constructivist view on academic writing, but he takes it further, and calls for productivity, hereby claiming that we produce reality by forming theory. The idea of production has a forward directed creative element to it, and views theory as an emergent product that also adds to the emergence of culture. Massumi further wants to

replace the concept of ontology with the concept of 'ontogenesis' (p.8), which changes ontology from a static conception into a dynamic eternally changing perspective that does, however, relate to us in deep and fundamental ways by setting the limits and potentials of our very theoretical and conscious point of departure. I have let myself inspire by this approach, while furthermore adding a semiotic point of view (Deely, 2005). Although Massumi's idea of emergent reality production is found fruitful, I will leave the possibility of a (real) connection between produced cultural reality and nature an open question.

From this point of departure, our method, by necessity, becomes unorthodox, productive, and explorative. We are moving into yet unknown and therefore uncertain territory. The explorative element arises because it represents an approach that has not yet been widely tested and therefore has to be further developed as part of the project proper. This will show in the project by, further than presenting the present introductory chapter on methodology, the methodological foundations for the project will be actively explored and developed throughout Part I. But what are the practical implications of the methodology established so far?

Since critical argumentation is not the main strategy, the function of academic intertextuality becomes different from established norms surrounding the process of academic writing. In this project the function of intertextual navigation (by the research subject) is primarily to find literature that can deliver vocabularies, conceptualizations, and central authorships that offer what I call *loaded terms*. Loaded terms are terms that have a potential to form intersection points where theories from

different disciplines can inform the same topic, and thereby bridge the enormous disciplinary gaps that are typical of contemporary disciplinary divides, in accordance with our topic in question. The affirmative approach (rather than negation through critical argumentation) allows us to navigate a broad spectrum of literature within diverse academic fields, and from there make the choice that will form the basic pillars of our production, which should lead to a fallible signification of the human subject. This approach is understood to present a genuine potential for the formation of a meta-level articulation that involves giving words new connotations. The method expresses a striving towards signifying the object in question through words and text in a way that is as precise as possible. But how can we talk of preciseness when it comes to philosophical considerations?

Preciseness, at a preliminary basis must be understood differently than exactness in the exact sciences. The project seeks to observe an intangible object (the consciousness of the human subject). Our only possibility to observe complex intangible objects is through words and language. The criteria of correspondence between the observed and its representation is a truth criteria typically used in positivistic science, where the ontology of classical positivism presents a material three-dimensional space of tangible and measurable objects, and where the symmetrical relation between the x in question, and the y that it corresponds to forms the point of departure (Stanford Encyclopedia of Philosophy, The Correspondence Theory of Truth, 2002)[3]. The correspondence theory of truth, however, has roots in Greek peripatetic philosophy, where Aristotle's original

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[3] http://plato.stanford.edu/entries/truth-correspondence/ (date of acess: April 5th, 2014)

use of the concept "aletheia" was closely connected to a metaphysical realism (Brier, 2005). In the course of this project, a central effort will be made to further question these opposing approaches to the relation between human subject and world, and what it means for our understanding of truth.

The integrative method that this project seeks to establish and use, demands a precise economical choice of textual resources, central philosophers, theorists and theoretical points of reference that will add to the research object in question. It further demands:

1. A potential in the theories for a higher order articulation that represents the meta-theoretical order of philosophy of science.

2: An overlap between theories from different disciplines that, while resting upon terminologies and research methods alienated from each other, articulate perspectives on the same dynamical object in question.

3: A strive for precision in the representation of the dynamical object in question

4: Consistency in the argumentation concerning the main theses proposed in the project, especially while in Part III thought experiments are carried out on the basis of the implications of central premises proposed in Parts I and II.

This strategy demands a combination of the active use of the research subject's intuition combined with academic skill.[4] The method demands that, besides from a clear correspondence between articulation and research object in question, and in opposition to traditional demands on objectivity, there has to be a correspondence between subjective insights of the generative philosopher, and the texts chosen for the textual syntax. This is in line with Nicolescu (2002), who writes:

> 'Learning to know also means establishing bridges – between the different disciplines, and between these disciplines and meanings and our interior capacities' (p. 133).

2.1. How can we understand the role of theory in the productive approach?

While trying to understand the use and production of theory in this project, it makes sense to look at Aristotle's original definitions of theory. Broadie (1991) writes of Aristotle's concept of theoria:

> 'Theoria' covers any sort of detached, intelligent, attentive pondering, especially when not direct to a practical goal. Thus it can denote the intellectual activity or aesthetic exploration of some object, or the absorbed following of structures as they unfold when we look and stay looking more deeply, whether by means of sensory presentation or abstract concepts.' (p. 401)

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[4] See Nicolescu, 2002, pp. 67-74 on quantum reality, imagination and knowledge

It is obvious that Broadie, with Aristotle, does not only mean looking as in the traditional understanding of this term. Looking, then, can also be an internal activity. Bohm (1980) writes of theoria: 'Thus it might be said that theory is primarily a form of *insight*, i.e. a way of looking at the world, and not a form of *knowledge* of how the world is' (p. 4). Thus, in our understanding, theory is closely related to experience. It forms a means by which to explore the world in an intimate relation between thought and language, and it is lead by an innate drive towards gaining wisdom (sofia).

In this light, we can understand that Part I of the project does, although named theory[5], present an exploration through theory that aims to actively change the setting when it comes to understanding academic epistemologies as opposed to philosophical epistemologies, which, again, allows us to pave the way for the generative philosopher, justifying the project's emphasis on the voice and identity of the first person observer, while simultaneously forming a methodological approach to artworks that is based on a new way of regarding transdisciplinarity, in part by integrating Nicolescu's manifesto of transdisciplinarity, and, more basically, Brier's cybersemiotic star and newly developed concepts (Brier, 2008).

Since this project aims to articulate theory of the human subject at the level of philosophy of science, and gradually developing and including the generative philosopher that, again, must operate from a perspective of transdisciplinarity, an account of the impact of new technologies on the self, and, none the least a process

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[5] Please recall the Aristotelian definition of "theoria" here

oriented view upon reality, contemporary philosophers forming theory of subjectivity, and of which well known contributors are Dan Zahavi, Evan Thompson, and Shaun Gallagher, have not presented the level of transdisciplinary integration or integration of theoria, strived for in this project. Zahavi's (2005) theory on subjectivity is deeply embedded in the philosophy of Edmund Husserl, however, presents an anti-transcendental approach, and a primary focus on a human science approach, which does not take into consideration the importance of integrating theories from other scientific fields, and theories of the impact of digital- and information technologies on the human subject. He also does not present an elaborated consideration of the philosophical implications of quantum mechanics on studies of the human mind. Gallagher (2005) in *How the Body Shapes the Mind* mixes phenomenology, psychology and neuroscience. He further presents a wide use of examples that rest upon a pathological approach to the psyche, and thereby an implicit division between the sick and the healthy mind, which this project seeks to avoid. On the contrary, this project seeks to establish an approach that is more in line with positive psychology (Gardner, 2006a; Gardner, 2006b; Csikszentmihalyi, 1990; Csikszentmihalyi,1996), which forms background reading, but not an explicit theoretical point of departure for the project.[6] Gallagher, furthermore, does not integrate quantum philosophy into his studies. Thompson (2007), in his book *Mind in Life. Biology, phenomenology and the sciences of mind* integrates biological levels of the body in his theory of mind and cognition, and furthermore re-works Kant's distinction between the noetic and the noemic, where he presents a dynamical outcome that connects both positions within one and the same intellectual frame. He furthermore

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[6] Peirce's idea of "evolutionary love", and the concept of "syntropy" (explained in the glossary) are found resonant with central messages of positive psychology, and are explored because a focus of the project is to integrate knowledge from alternative branches into the human science approach.

inserts an evolutionary perspective, which is not typical for a human science approach, and which takes him far in his considerations. He is, however, embedded in a material-realism that connects his theory very directly to neuroscience, and with a conception of cognitive theory that is much in line with information science, which represents a more instrumental paradigm. I agree with Thompson's decision to combine biology and philosophy in an evolutionary paradigm, however, in this project I am searching for a biological approach that is open to a wider degree of transdisciplinary integration, and an ontology that moves beyond the instrumental information science inspiration.

In order to direct the reader further, when it comes to the project's placement within the field of subjectivity theory, we can say that our questioning of the human subject takes its primary point of departure in the field of Philosophy of Science, not in theories developed as academic practice. This also concerns philosophy of science that has not yet been integrated into the established canons representing this field (for instance the integration of philosophy of physics into the humanities and social sciences). It therefore relates more to the level of philosophical consideration presented in for example the historical opposition between philosophical contemplations on the knower, such as the well known historical empiricism (John Locke's human subject as a "tabula rasa" and the idea that knowledge primarily stems from sensuous experience of an externally given material world), and rationalism (Descartes' famous words "cogito ergo sum" and the idea that knowledge primarily comes from inwards rational activity), towards Kant's famous categorical imperatives (apriori categories and judgments as a point of departure of the mind), and, at a more contemporary basis, towards Brier's socio-communicative autopoietic intersubjectivities (Brier, 2008), representing the deep

philosophical implications of understanding the knower as either primarily inwards directed, or outwards directed, or oscillating between subjective and intersubjective levels (the last of which are based on language games), than it does to analytical philosophy, cultural, psychological or literary theory concerning the human subject.

2.2. The generative philosopher

Peat and Bohm (1987) write of creativity in research, where they emphasise the importance of thought, and the creativity of play in thought as a part of the academic research process (p. 37-41). Here, play of thought is understood to present an important potential for a creative, generative process, and is viewed as an important activity; especially in times where it is necessary to generate alternative theoretical frameworks and to experiment with theoretical possibilities outside of existing frameworks. While thought as experience underlines our view upon the first person subject as being in constant motion through experience; sometimes even fundamentally changed through the experience of theoria; the idea of thought as perception adds to our question concerning the correspondence theory of truth: how do we, actually perceive the world and of what does the external world consist? We are re-actualizing this question as a part of formulating a concept of truth, and the case studies in Part II of the project will be centrally preoccupied with this question as a part of questioning the human knower.

The propositions of Peat and Bohm go well with the process oriented view, and the idea of the necessity of accepting the generative nature of the research subject, which also demands of her to become an explicit active first person philosopher and thinker, where there is a tight connection between the first and the third person human subject. And we must make clear that we do not operate with a fixed human

subject, neither in the first nor in the third position. They are both developing; as the project proper progresses. And each position affects the other in ways both linear and non-linear (which again, by necessity, must affect the structure of the academic text). But what further characterises our generative philosopher?

The generative philosopher is a practitioner, but a practitioner of thought. She seeks to drive thought to its utmost potential. By this act, she is creating; she is producing bits of reality, while simultaneously relating to an external reality of a kind. Moving a little further on the inside, with Maturana and Varela's autopoiesis theory (Maturana & Varela, 1987), it seems only fair to expect that there are autonomous levels in generative thought processes that are not equal to the way intellectual awareness is consciously and logically directed, the last of which is the position of the traditional academic worker. There is, a high level of sub-conscious generative mechanisms that form our processes of thought. We want to seek a broader formulation of these mechanisms, in order to know more of them. One way of doing this is to let the generative creative processes of thought come to the fore through the explicitness of her thinking process.

2.3. Writing style

In line with Nicolesu's (2002) idea of in vivo research, which I will present further in Part I, Chapter 3, my research strategy will strive towards a pattern of thought that does not constrain itself within implicit directions from the logic of binary oppositions (implicit contradictions) and a non-acceptance of paradox, which, sub-consciously, colour processes of academic reading and understanding today (Aristotle, 1998;

Nicolescu, 2002; Kelsoe & Engstrøm, 2006). Actual contradictions that are sought overcome are the distinct opposition between subject and object, the opposition between individual and collective, culture and nature, idealism and realism, quantum and particle reality, consciousness and matter, and disciplinary oppositions concerning different aspects of the human subject.[7] The aim is to create a holistic framework, where these oppositions form complementary pairs, rather than mutually exclusive opposites. I further seek to move beyond the divide between the human and the natural sciences, between evolutionary and hermeneutical paradigms, and between print theory and art works as validated forms of knowledge.

I must note, already here, that when it comes to my use of theory from the natural sciences, including biosemiotics and holistic biophysics, where I creatively and philosophically mix these in order to find points of coherence between biological, mental and social levels, factual precision concerning how the biological levels, involving quantum biology, molecular biology, the connection between micro and macro levels of the organism, is not within the scope of this thesis. This thesis aims to present conceptual propositions of possible overall connections between emergent levels of the biological body, and kinds of thinking and communication that must be described by languages other than those of the natural sciences. The conceptual integration of areas that have not been expressed academically, as of now, together with the integrative vocabularies and texts, are what presents the original proposal of this thesis.

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[7] For instance the opposition between biological and philosophical explanations

2.4. Reading directions

It is central for the reader to be aware of places within the text, where the aim is to add new in-depth elements that add to the same topic, rather than to seek linear cause and effect explanation and vertical progression without horizontal depth. At the epistemological level, I will move from transdisciplinarity, into a syncretic approach in one case study in Part II, whereas in Part III, I further integrate religious perspectives. The reason is that in part III, I seek to establish new ontologies, which typically demands metaphysical and religious considerations. Here follows an overview over the three parts of the project:

Part I places the problem of human consciousness in the context of philosophy of science, and gives a thorough description of the problems and consequences involved when trying to redefine human subjectivity at a deep, ontological level. From here, I will move into an epistemological context, where I question the idea of superiority of contemporary knowledge as opposed to philosophical knowledge of Greek Antiquity, by emphasising ontological depth. I will place technoetic arts on the art scene, and in the socio-cultural context, and articulate why I find this kind of art to be particularly rich in significations extracting the most essential elements of the current socio-cultural knowledge situation, and in directing attention to future knowledge when it comes to understanding the human subject. In Part I, I will furthermore introduce Søren Brier's cybersemiotic theory. I will argue why and how the theory is useful to this project. Part I of the project gives a theoretical introduction to the cybersemiotic theory, while part II presents its use as a part of my case studies.

Part II demonstrates readings of technoetic artworks from a hermeneutical, semiotic approach in search of a new, semantic syntax that can be established across paradigms, across levels of reality, and across current systems of cultural semiosis, which can present new input to the production of creative sketches of the human subject. Each chapter will be based on a theme, which is considered central to questions of human knowing.

I will end my case studies by forming an overall conclusion, based on an abductive cohesion of central points reached through making the respective case studies, and thereby connect bits of meaning into the concept of an ideal user, who represents our productive view, and presents a new way of conceptualising the human subject.

Part III consists of three main chapters, an introduction and a conclusion. Each chapter aims at constructing ontological positions, which, if taken at face value, cause profound alterations in dominating views upon the human subject, which, again, will affect the way we read the project proper and how we understand the academic subject writer. Part III presents three basic approaches to ontological standpoints, all of which are understood as central in forming deep ontological positions. They are presented as thought experiments that build upon central theses already presented in the project, together with additional literature that can inform the topics in question.

Part II of the project, as well as Chapter Three, Part III, are built over a series of articles produced and published as a part of my PhD research. These articles have been re-written in order to make them fit into the overall context of the final thesis.

I must further point to the fact that I have, during my research process encountered the work of Søren Brier, which has come to form a central role in this project. This is so in particular, because we share a similar motivation and interest in likely problems and their philosophical solutions. I must, however, claim that the original conclusions in this project are derived through my personal work with the topics involved, even if some conclusions are similar to Brier's. The cybersemiotic theory delivers central terminological "tools" (concepts) for the project. Brier has formulated what I have not found in other theories, and what is in line with the aim and direction that I was heading towards. He thus supports this project with a foundation that allows me to articulate what I have had in mind before I had ever read his theory or encountered him in real life!

Part I: Theory (theoria)

Chapter 1: Philosophy of Science

3.0. Historical and epistemological perspectives

The main area to which I connect my studies of human subjectivity is philosophy of science. The point of departure of the overall thesis, however, is pre-scientific. I seek to develop Philosophy of Science into a Philosophy of Knowing (which is the original meaning of *science*) that also takes technology-assisted art actively into account as validated research. But let me commence by shortly explaining the nature of philosophy of science, and place it in the context of philosophy at large. After that, I will discuss the idea of epistemology at a pre-scientific level, and contextualize this understanding with a view on the contemporary situation, using what Edmund Husserl originally called "epochè". Epochè means to approach a topic with an open, naïve horizon, where all existing knowledge is placed in a parenthesis.

Philosophy of science is a meta-science. It involves considerations that, in principle, concern all existing branches of science, from the natural sciences, the life sciences, and the social sciences to the humanities. It is not equal to science. And it is not exclusively equal to philosophy either. Philosophy of science is philosophy that considers the nature of science and its history. It has not always been certain exactly which processes of knowing that can lead to science. Therefore, the meta-discipline that philosophy of science is, discusses these issues as knowledge progresses, develops and transforms

over historical time in a process where experiences are collected and presented on behalf of retrospective causation. In this chapter, I will be preoccupied with the question of how epistemologies, based on the practices of academia on the one hand, and on a pre-scientific concept of knowing on the other hand, have historically come into form, and how their truth value might be understood. On the one hand, Plato and Aristotle originally talked of "episteme", while Foucault (2002) in the 1960'ies formed his version of the concept "episteme" that varied from the original connotations of the term. But what is the difference between them?

Epistemes are, to Foucault, discourses that form central pillars of knowledge in a society. They have primarily been formed by thinkers in philosophical and academic communities, and are therefore attached to newer academic practices. Epistemes become determinate of discourses and of what can be considered legitimate knowledge at a certain point in history.

The Danish Professor, Lars Qvortrup (2003), uses a Luhmann inspired idea while forming his concept of 'social semantics', which is inspired by Foucault's idea of epistemes, and further involves processes of autopoiesis.[8] As a part of the inspiration from Luhmann, social communications are understood to be that, which forms social systems per se. Therefore, they are central. It is Qvortrup's claim that contemporary society is formed by the epistemes that we subscribe to. These epistemes affect processes of communication and thinking in looped, cybernetic processes. By thinking about epistemologies as a social semantics, from our pre-scientific point of

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[8] Social communications have a self-regulating element to them

view, we are able to approach the topic from a combination of the pre-scientific speculations of the generative philosopher, while still taking academic knowledge seriously into account. The social semantics that Qvortrup characterises is understood to, through the discourses involved, refer to an articulation of a collective socio-cultural level of experience, which is, however, always more than its linguistic, academic expression. In this project, we are taking a realistic approach to the referential value of epistemes, while still keeping the element of contingency in mind. Epistemes do refer to social and physical realities that are ontologically understood to exist. However, they are strongly affected not only by dominating paradigms and the influence of existing discourses built on behalf of these paradigms; they are also affected by the very particular lines of causation that underlie dominant academic discourses, and which I expect to be affected by underlying levels of collective consciousness. So far, we can only define such levels by referring to autopoietically generated social communications, and in more particularity, to specific discourses. However, the project strives to dive further into this collective aspect of consciousness.

Our position of observation is, according to the project aim and methodology, a meta-position. In accordance with the autopoiesis theory that Qvortrup subscribes to via Luhmann, a social semantics based on epistemes, would actually leave in a level of contingency in the choice of dominating knowledge that characterises our cultural era. This means that existing epistemes could also always have been otherwise.

It is on this basis that I seek to question traditional conceptions of the two overall lines in epistemology: cultural epistemes based on an academic background that colour conceptions of academic reality on a more general basis, and a broader

philosophical epistemological horizon, both of which intertwine, however, distribute central qualitative differences, in particular when it comes to ontological depth and degrees of incorporated wisdom and human self-acknowledgement. The basic traits of the two epistemological lines of experience that I seek to characterise concern:

1. Recent academic endeavour, including the increase in disciplinary specialization, within approximately the past 100-200 years, from the time of increased positivistic domination (from Comte's philosophy of positivism in the mid 1800's.)

2. Our philosophical heritage, which I understand to have commenced at a pre-scientific level, approximately 2500 years before Christ with Greek Antiquity.

As a part of the aim towards discussing dominating epistemologies, I will reflect on the contemporary situation. Peat and Bohm (1989) presented the idea that a fragmentation of thought as a historical effect of Western academic practice had been taking place. This fragmentation in thought has been caused by an increased degree of disciplinary specialization within academic institutions, and in particular within the fields of the natural sciences. Peat and Bohm were not opposed to disciplinary divides; however, argued that an increase in specialization has alienated researchers in varied fields from each other. This alienation, in part, lies within the vocabularies that have arisen from highly specialized practices. In opposition to this fragmentation, Greek antiquity presented lines of thought that were much less separated, and more holistic by nature. We find an equal holistic approach in the European Renaissance, before the institution

of science was firmly established at a social level, and where, according to Qvortrup, the human subject understood herself to be in the centre of her experiences.

There are several perspectives that one can place upon the presented division into epistemes and the philosophical epistemological horizon. By drawing attention to the long epistemological line that connects Antiquity with contemporary science and socio-cultural epistemes more directly, it becomes clearer that knowledge derived in pre-scientific, esoteric and introspective manners, such as the work presented by Plato, and parts of what Aristotle[9] and Pythagoras delivered, both contradict currently accepted scientific truth values, especially when it comes to methodologies (since the Greeks apparently used esoteric approaches), however, simultaneously forms a necessary prerequisite for the knowledge that we derive today. This discrepancy points towards the fact that we need to take into serious consideration the actuality of a kind of knowledge, which is not primarily derived from empirical testing, and which, however, has a lasting value and effect at the level of social semantics, even beyond the time scales of single generations. The Danish philosopher, Dorthe Jørgensen (2002), talks of *wisdom*. According to Jørgensen, wisdom is part of the socio-cultural horizons that have been formed over generations. This is particularly so at the etymological level. Therefore, the wisdom presented in Antiquity, and its methods of derivation, cannot be de-valued as naïve and romantic, and historical, rather than actual. The methods of knowledge derivation presented by original esoteric philosophers must be taken seriously into reconsideration.

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[9] I am here using Aristotle and Pythagoras as a reference to the overall knowledge cultures presented by our access to Greek Antiquity, and pre-Socratic thought with a particular focus upon the fact that large parts of this knowledge was derived in esoteric manners.

The time through which pragmatic use of central concepts of Aristotle have been relevant in Western cultures seems to be at least 2500 years. This does not concern singular factual claims, such as Aristotle's idea that the laws of the heavens were of a different nature than such of the earth.[10] It rather concerns central bits of wisdom that are carried onwards over historical time by the function of *loaded terms*. Loaded terms are terms that present a basic level of meaning, which can be ontologically expanded, and thus continue to be used in processes of meaning making, in spite of the fact that concrete, social conditions change over time. This is the reason why I wish to emphasize and reconsider the effect of the long epistemological time line.

My suggestion is, in some accordance with the Hegelian line of thought (Hegel, 1977), that we must, again, question the contemporary understanding of progress in human knowing, which, in much accordance with the philosophy of Auguste Comte (Lenzer, ed., 1998) understands the methodologies of the exact sciences to represent a higher stage of knowledge than the esoteric practice of wisdom demonstrated in Greek Antiquity. And this cannot be done by subscribing to Kuhn's doubt in Compte's vision of scientific progress as a linear unidirectional development of scientific facts. Thomas Kuhn (1996) was preoccupied with pre-scientific metaphysical assumptions that he understood to function as an implicit prerequisite for research in the natural sciences. He was concerned with institutional science. What we are questioning here, however, is rather the level of depth in wisdom, than a linear, material progress in empirical studies

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[10] Which would have to be interpreted differently if our ontology was not that of Comte's hierarchy where physical science is taken as a very basic science. In principle, Aristotle could have given this statement meaning in accordance with a deeper metaphysical point of departure.

and the formation of logical deductive hypotheses. In order to understand this question proper, we must view progress rather in line with Hegel, as the gradual progression of spirit implementing itself in society and developing through this process. It is our expectation that the philosophical epistemological line and the academically derived epistemes will tell us different stories, when it comes to the implementation and development of collective spirit in society. We will, however, as part of the new vocabularies presented in this project, not take the implicit ontological division between the ideal and material reality that is understood to be basic in Hegel's philosophy at face value. We will question and seek to overcome the dichotomy between these mutually exclusive oppositions, which we also find as an ontological prerequisite in much newer philosophy.[11] We must thus localize the implementation of a spiritual collective development through an ontology that can encompass both the concrete, material as well as the immaterial level.

Since esoteric approaches and metaphysical elements have been widely suppressed because of the recent domination of logical positivism and overall instrumental approaches in science and technology, due to the actuality of the agora and the market place being the most powerful centre of modern global societies, it is my observation that we have become blind to the depth of ontology, the value of wisdom, and its wider implications for all further insight. It is my expectation that questions of subjectivity and consciousness cannot be answered by taking a superficial, and human-centred, materialistic and so-called objective ontological position, such as that of much scientific

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[11] The philosophy of Karl Marx is for instance understood to be materialistic, as opposed to Hegel's philosphy, which was idealistic. Plato's philosophy was ideal, whereas Aristotle aimed at implementation of knowledge into the materially existing social world.

practice today; it must seek into the depth of new ontological dimensions, and establish a humble relation to nature as something bigger than human beings and human societies. This is where the re-actualization of the general and abstract ponderings of the generative philosopher becomes relevant.

3.1 Epistemes, philosophical epistemologies, and current disciplinary divides

So what, more concretely, forms the epistemes in academic institutions today? When it comes to giving a superficial overview of the most important works and philosophers in philosophy of science, we typically begin with the ideal philosophy of Plato. From here, we move on to Aristotle, who is understood as a central figure that delivered terms, to which we still subscribe today, even in times of paradigm shift, when a shift within particular disciplines (like New Media in the human sciences) needs articulation. From here, we move onwards to central characters such as Copernicus, Keppler, Galileo, and Newton, when it comes to natural philosophy, and Descartes, Kant, Hegel, and Heidegger when it comes to philosophy on rational thinking and phenomenology. Underlining the essential part of empiricism, the philosophies of Francis Bacon, George Berkeley, John Locke and David Hume are typically considered central (Brier, 2005).

When it comes to the period between approximately 1400-1700, the stride between rationalism and empiricism was prevalent. As a footnote to this, it is interesting to notice that we find this stride in another form in pre-Socratic thought, where philosophers did not agree upon whether knowledge should be primarily empirical, or based on pure esoteric speculation. And this might prove the stride to be a basic human conflict, rather than historically conditioned. The on-going question has been, whether

true knowledge comes first and foremost from reason (inwards directed) or from sensuous (outwards directed) experience. Thereby we have a clear subject-object dichotomy that is often being pursued in logical causality of explanations underlying much current theory of human subjectivity (Zahavi; Gallagher). This question is also essential, when we are trying to understand the ontological depth in socio-cultural *epistemes*. But, although we are talking about a general subject-object divide that has persisted through historical time, let us not, however, be confuse concepts such as 'rationalism' and 'esoteric speculation' with each other, thinking that they form the same level of depth in knowing – even if both approaches focus on the inner subjective level. As a preliminary thesis, we could say that while reason would rely on the intellect and its cognitive capacity based on logic, esoteric speculation would present a wider, however, yet undefined potential for inner mind travelling beyond the functions of the logical mind.

A recent focus on still more sub-disciplinary specialization within 20th century science has led to the contemporary situation, where increased separation between fields, and where epistemes have expanded from a point of departure of separation, has resulted in a level of complexity and still more advanced vocabularies that cannot meet over the borders of disciplinary fields. This divide prevents us from forming the kind of vocabularies and discourses that would be adequate in order to grasp something such as human consciousness. As I encounter the problem, however, it is exactly in the intersection point between physics, biology, human- and social sciences that we must find our contemporary human subject. The failure to see commonalities and overlaps

between fields is what makes us indifferent to central aspects of our own humanity. Simultaneously, however, disciplinary specialization has delivered new research techniques and ground-breaking results, in particular when it comes to nanoscience and nanotechnology, which has brought new insights, but which do, however, mainly serve instrumental and pragmatic goals. Thus, there is a need to re-define and combine the two epistemological timelines.

3.2 Historical development of the observer subject

But let us, shortly, look at the historical line that lies behind the situation of disciplinary divides that we see today, with a focus that can enlighten our main point of interest: the simultaneous understanding of the observing and knowing human subject as an object of research (3rd person perspective) and as a prerequisite for research (1st person perspective). We will do so because the disciplinary divide has a history of gradual establishment of disciplines over time, which also connects to the historical transformation of social structures, according to Qvortrup (2003). All of this affects the phenomenology of spirit, and places a perspective on our conception of the human subject.[12]

Qvortrup, while integrating the theory of Luhmann (1988), characterises a shift in social structures that moves through three important periods, and which is central in our understanding of the human subject: a theocentric-, an anthropocentric-, and a

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[12] Here, in the form of the observer, however, we are seeking a conceptualisation that can encompass both the position of observation, knowing and sensation

polycentric period. The period of anthropocentrism involves the Renaissance idea that the human subject was in the centre. According to Qvortrup there were a belief that the human subject had a privileged position as an observer. The Renaissance was also the time where there was no clear division between art, science and philosophy, which is why the human subject could be viewed from multiple angles. In the polycentric society no one observer possesses privileged knowledge. All observers are inside the world that they try to observe. Observations become individual, relative and contingent. There is no truth, expect that, which serve pragmatic and functional goals. Social systems emerge on behalf of contingent self-generative and self-maintaining processes (autopoiesis). The deep ontology is that the world is a random place, and that we don't ask ontological questions; autopoietic and emergent systems have no deeper reality reference. In Qvortrup's polycentric society, where social systems are functional more than stratified (built on hierarchical order), and from a point of view of philosophy of science, we can look back and say that we have had a period of domination of the natural sciences over the human sciences, and a domination of objectivist paradigms that lie close to logical positivism. Furthermore, we have had increased specialisation and alienation between researchers of the respective fields. This has, together with the formation of the polycentric society, affected the way we implicitly and explicitly understand ourselves as knowers, and the role of the human subject in research. Our prospect, however, is to localize a human knower who is beyond the position of the polycentric vision and positivistic domination, and whose image will appear on a basis of transdisciplinary integration, in particular through the vocabularies that we choose. In order to connect our meta-level components, however, this post polycentric human subject would have to move into a higher order level of subjective centrism, while still

being coherent with the intersubjective realm that we call society, having integrated experiences from the polycentric era as well.

Academically, it is particularly the paradigmatic break concerning the consequences of quantum mechanics that led to the observers problem, which we also see in second order cybernetics, along with the problem of representation in the human sciences, which appears with post-structuralism and postmodernism, that lead the objective foundation of the sciences into serious doubt. Following these lines of development, and in particular the implementation of computer- and information technologies at practically all levels of society, which has turned the focus of attention towards unresolved ontological and practical questions concerning the equality, dichotomy and/or symbiosis between machine and human, an increased need to re-consult questions of subjectivity, cognition, feeling and mind has arisen. What is complex about these developments is that they affect both the inner worlds of the subjects involved, as well as the way we can describe them from a third person perspective. It is common in academia to think that the third person perspective can be unaffected by the first person background. Our claim is that it cannot. If we want to gain a higher degree of self-understanding, which is here understood as a necessary pre-requisite for knowing per se, first person perspectives must be taken into account together with third person perspectives. We can no longer hide ourselves behind a veil of assumed objectivity. Especially not in disciplines that seek meaning and understanding. However, we do not wish to start from scratch in a form of epoché that excludes central academic epistemes. We take the present academic horizon actively into account. From this point of

departure, we can summarize and define the central characteristics of the two epistemological timelines further.

From app. 1900 till present
Institutional epistemology
Disciplinary divides
Material, positivistic dominance
Anti-ontological approaches
Exoteric approaches
Understood by retrospection

From Greek Antiquity till present
Philosophical epistemology
Acceptance of metaphysical and ontological positions
Esoteric approaches

Present and future

21. century and onwards
Example: Digital Humanities, Technoscience
Understood in the academic complex
Now, and through anticipation

Figure 1: Illustration of the epistemological timelines.

The timelines are viewed in accordance with a degree of stability when it comes to ontological depth. Stability in the long term paradigm in spite of the institutionalization and institutional revolutions of the short timeline comes from the hypothesis that the kind of theoretical thinking produced in the short timeline has not assimilated and transgressed the level of ontological depth by which Plato, Aristotle and Pythagoras operated, even if Aristotle's stable, organismic cosmos and his strong division between the laws of the heavens and the laws of the earth are understood by Brier to have been overruled by Newtonian mechanics (Brier, 2005; Brier, 2008). This claim is only legitimate if Aristotle by "laws", "heaven" and "earth" made a concrete, material reference. We have no certainty, however, whether Aristotle's terms could present a reference with more ontological depth. What exactly did Aristotle mean by "laws"? And

what did he mean by "the heavens" and "the Earth" as understood in the original context? We experience discrepancies between micro- and macro levels even today? So how far did Aristotle's thought actually reach? Was he solely concerned with a materialistic division between the cosmos and the Earth? Or was he referring to deeper metaphysical levels and essences? The question is whether adequate interpretations of Platonic and Aristotelian concepts within current dominating scientific and philosophical paradigms have been reached? When it comes to loaded terms, I am referring to the state of ontological depth from which concepts such as the heavens, or important terms such as phronesis, techné, aisthesis, and nus have been derived.

Further from characterising a long and a short epistemological timeline, we must take into consideration the cultural unconscious of generations, which has influenced on interpretations and ontologies dominant in the academic institution. We must take into account a possible variability in historico-cultural horizons (to borrow a perspective from Gadamer, 2004), which would have formed the foundation for adaptation of these loaded terms. It quickly becomes obvious that these variables do not present one easily detectable common ontological level that is stable across geographies, cultures or historical time. But to summon up once again: what I openly question is whether the ontologies behind the wisdom presented in Greek Antiquity would have been deeper and wider than their on-going interpretations in the knowledge cultures that were to follow, and especially present day Western academia.

The polycentric society that Qvortrup describes, is, in my view, characterised not only by many rationalities based on self-observation and social negotiation, but also by a general lack of ontological depth. Evidence of this can be found in the book *The Concept of the Network Society: Post-ontological Reflections* (Qvortrup, et.al., 2007), where Bo Kampmann Walther writes of the current state as a state of "post-ontology". In the introduction, Walther presents to the reader a so-called 'mundanised' understanding of epistemology, which claims that epistemology can no longer 'think by itself' (meaning that there is no deeper ontological level to provide a basis for epistemological horizons). This is strongly inspired by Luhmann, Bateson and second order cybernetics, where information is understood as a difference that makes a difference, and where understanding is a function that builds upon meaning as complexity reduction, but where there is no deeper foundation behind these functionalities. Obviously, the state of post-ontology implies that there is no reason or insight that can be prescribed to thought itself, because the observer is always already an implied part of what s/he observes. This claim, however, has wide implications, and as it might appear, I do not subscribe to the idea of a post-ontological condition. I find it to be reductive and inadequate when it comes to capturing the potentials and possible discrepancies between human thought and the state of the arts of the social level. And it closes the potential for viewing the possible discrepancies between the two positions. In a way, one could say that at a level of the network society, this claim would relate to the conceptual, and mutually exclusive dichotomies of empiricism (matter) versus rationalism (mind), or realism (the objective world) versus idealism (the subjective world), where Walther is seeking the dominance of a pragmatic kind of intellectual empiricism and/or realism (objective materialism).

The hypothesis that I seek to articulate is not based on a Postmodern perspective, which typically counter poses the idea of irreversible progress as part of an overall epistemological pathway in Western cultures, which Lyotard (1984) in his conception of postmodernism originally emphasized. Bohm and Peat (1989) wrote of creative waves in history, such at those of Ancient Egypt, Greek Antiquity and the Roman Empire. These creative waves could be viewed as peak states in the collective experiences of human knowing, where academic paradigms would be strongly subordinate to such a perspective. The focus upon other central pillars than Compte's idea of science as progress, and Lyotard's lack of faith in grand narratives, has consequences for our perspective on science and knowledge, affecting the causative structure of our basic assumptions.

3.3 The contingency of knowledge, cultures and individuals

In order to accept that science is not all there is to human knowing, we must understand the process of collective human experience as operating with more than one level of emergence, which means that knowledge is not one easily definable phenomenon that either progresses or moves in random directions. I would suggest that human epistemological knowledge[13] could be regarded as a multiplicity of processes that emerge according to more than one basic evolutionary time scale, and where the idea that the academic process leads to the highest level of knowledge is becoming increasingly uncertain. In addition to this, and somewhat in the spirit of Luhmann, the term *contingency* comes to play a central role in the learning process of our generative philosopher; which, as we recall, involves an accumulation of useful vocabularies in

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[13] Where knowledge is based in insight and experience rather than accumulation of data and facts

strategies of articulation. Contingency is not necessarily anti-realism, however. It only takes the relation between the experiencing language based human subject and reality to the next level of complexity. I will extend my understanding of constructivist contingency with Peircean pragmaticism, when I introduce Brier's cybersemiotic theory in chapter 4.

To Luhmann, communication is what forms society, which makes it a central part of social evolution. Therefore, Qvortrup finds that knowing and learning play central roles in the formation of social systems and sub-systems, a topic that Qvortrup has specifically elaborated on.[14] I expect a deep connection between social learning, knowing, and epistemes. To both Luhmann and Qvortrup, social systems are emergent and autopoietic, however, without a deeper reference to anything in reality. I would like to insert Qvortrup's idea of knowing and learning, but also a degree of inbuilt will and direction within the overall social autopoietic and emergent formation. Contingency in knowledge structures concerns individuals, but also social systems at large. They are not one to one with each other, but they are necessary pre-conditions for each other. This way of viewing it makes it possible for each organized system to be observed as a potential *identity*, which is based on learned knowledge. The system identity inheres a relative level of freedom and constraint. This identity differs from Foucault's discourse by inhering an inbuilt telos-like function, due to an implicit element of cognition and consciousness. By making this suggestion, we have, of course, transgressed the theoretical frame of Luhmann, who would have never accredited consciousness to the

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[14] *Det Lærende Samfund* (Qvortrup, 2001)/*The Learning Society* (my translation), and *Det Vidende Samfund – mysteriet om viden, læring og dannelse* (Qvortrup, 2004)/*The Knowing Society – the mystery of knowledge, learning and becoming* (my translation)

system itself. We have thus levelled our epistemes, and have made them part of a larger mechanism, which we do not know in total at this point. However, the implication is that, both an individual, a minor intersubjective formation, and a social formation can represent a stage of experiential knowing. This viewpoint presents an overall and abstract way of looking at the process of human knowing, and its relation to socio-cultural formations. In stratified societies it was enough to look at the process top-down, because knowledge was derived by those in power, and learning implied for the less powerful to adapt to the knowledge of the powerful; or to not have any knowledge at all. In postmodern society theorists such as Bourdieu, Mouffe, Laclau, and Foucault were preoccupied with flattened power structures, and power as a mechanism that lies behind the dominance of particular discourses and social formations. In the hypercomplex, networked society that characterises our social point of departure, and with an increased ease in discursive exchange evoked by social media (among other elements), the degree by which non-empowered leaders of discourse can affect common processes of epistemological horizons is more open for change than ever. The hypothesis placed in this paragraph is that levels of consciousness, thereby ontological starting points for knowers, are not equal – which affects insights in ways that are, however, not made explicit, and not easily definable. In addition, a higher degree of access to articles and research material in open libraries and on the internet, together with a possibility for skilled exchange in social media, makes it possible for non-scholars to accumulate epistemic knowledge while simultaneously being freed from the, sometime, rigid constraints of academic method. As much as we can imagine the possible fallacies that can happen in such a process, we cannot exclude the potential of

skilled knowers developing on this basis. Especially taking wisdom as a necessary prerequisite into account.

On this background, it makes sense to ask the question whether we can expect today that knowledge developed in the academic system on the basis of traditional academic methodology delivers a higher degree of truth than knowledge more freely derived? Here, we are thinking primarily of the free act of philosophy, accepting philosophy as a generative activity of thought, which leads to deeper insight?

The combination of social systems, communications and individual versus collective contingencies, makes the landscape of knowing complex to consider. But the problems that lie inherent in these seemingly opposing phenomena also open up towards the possibility of taking a constructive path into a higher-order observation that can encompass oscillatory positions and that situate the individual human subject in accordance with levels of collectiveness in more than one way.

3.4.1. The individual versus the collective

During the pursuit of the research presented in this thesis, I have found that the problem concerning the relationship between individual and collective colours ways in which we perceive the human subject, and the way we construct the causalities of academic discourses today. This problem needs to be articulated and solved. I have localised it as an implicit part of theories concerning network societies (Taylor, 2001), theories of digitally virtual societies (Levy, 1998; Levy, 1997), or even such that are understood to

be carried mainly by thought (Bohm, 1994). And I have found it to result in reductive versions of the human subject, which are not questioned explicitly. I have discovered that a central problem concerning observations based on oscillations between individual and socio-cultural formations is that it must be possible to talk of knowing at levels of the collective, which is not only characterised by discourse and power formations, but rather concerns deeper levels of mind. In order to solve this problem, we must simultaneously integrate and transgress borders that lie at the level of distributed information, negotiation through collective language games, and their cultural mediation: the level of collective mind indicates that *cognition* and *consciousness* is understood to manifest both at individual and at intersubjective levels. Collective cognition and collective consciousness are understood to be, by nature, pre-scientific, and pre-artefactual. That, however, does not mean that they are not intentionally directed, and present character and qualities. This is why we have earlier talked of systems identities. It must further be expected that there are multiple levels of intersubjective formation, so that it becomes possible to talk of social cognition or social consciousness not only as single wholes, but also as multiple identities that are, however, not exclusively defined by their social status (politics, science, or something such as Bourdieu's social capitals to mention but a few examples). The idea of social polycentrism gives us the first building brick in order to form such a perspective.

On this basis, I find it necessary to move out of a viewpoint that is based on an implicit idea that there would be a static separation between object and observer, and between human subject and society at the level of consciousness. This is not a critique of the

functional, instrumental and positivist approaches that often dominate the social sciences, as much as it is a critique of a space-time relationship that I find to be inherent in academic theories at large, which is unrecognized, and which has to do with the basic premises that lie behind argumentative structures in academic discourses. Again, the static subject-object relation must be shifted with a dynamic and process oriented point of view, where everything is connected in space and time through different coordinate lines that set up a frame for a contingent rhetorical and narrative structure that could also always have been otherwise.[15] This has as a consequence that the cause-effect rationalities that one would operate with must involve an explicit element of relative time; and a relative connection to more than one conception of space as well.

3.5. The necessity of a multi-levelled reality

In order to be able to articulate a difference between one epistemological horizon and the other, I have found it necessary to split reality into more than one realm. I have been inspired by the social scientist Kate Forbes-Pitt (2011), who in *The Assumption of Agency Theory* establishes five reality levels. Forbes-Pitt herself is inspired by Roy Bhaskar's (2008) critical realism, in which he breaks with the fear of ontology in the social sciences, and presents a paradigm with an open ended ontology. The business theorist Fleetwood (2005) has worked further on Bhaskar's ontological domain, and has presented four categories of the ontologically real. The levels established by Forbes-Pitt, under these inspirations, are: *the artefactually real*, *the socially real*, *the ideally real, the materially real* and *the virtually real*. The idea of dividing reality into several realms

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[15] The term *coordinate* is used metaphorically, as opposed to *mechanism*, which I found would be close, but misleading. The use of metaphor is not completely accurate, however the closest I could find at the given time.

makes me able to explain some of the problems that arise, when I seek to move deeper into my characterization of the main differences between the long and short-term epistemological timelines. It, furthermore releases us from having to view the ideal and the material as opposites, and is promising in our request to liberate ourselves from stiffened subject-object dichotomies. I have, however, found it necessary to change Forbes-Pitts definitions of the reality realms, in particular when it comes to the ideally real and the virtually real. I have also found it necessary to add more levels. My expectation is that the reality levels can work as one of the basic ontological premises that can inform the further learning process of the generative philosopher, and thereby broaden her potential for meta-articulation.

I will give a short introduction to how I choose to present these ontological levels, and further elaborate on them, when I take them into use in the case studies of Part II of the project. The first level refers to the physical-material side of the social realm. It is called the artefactually real, and it forms the part of the social realm that involves the development of cultural artifacts, such as new technologies, which are understood to happen on the basis of knowledge as part of a cultural learning process. With an Aristotelian term, we could say that it connects to the concept of techné. Today, the artefactually real plays a major role in socio-cultural living and knowing, and affects many of our intentional interaction patterns. This is also a main thesis of Forbes-Pitt, and it forms a pre-requisite for her idea, named 'assumption of agency' (assumption of agency relates directly to the role of advanced computers and digital technologies by which we interact). While additionally having technology based art and design in mind,

we could also say that the artefactually real forms the level of reality, which is the most direct material expression of human intent, will. It relies on our imagination and inner human desires. And it is my subjective, but skilled, observation that the degree by which imaginations, desires and knowledge are expressed in cultural artefacts has increased. I will mostly use the concept as a reference to cultural material objects; but the digital realities of the computer, the underlying logic by algorithmic coding, and the virtual realms connected to digital interfaces and the World Wide Web, are also viewed as a level of man made materiality. Besides from the artefactually real, I operate with the materially real. The materially real, in the way that I use the concept, represents the parts of physical Nature that can be sensed by humans, and which are, however, not generated by human intentional will.[16] The socially real connects to what Brier, in a combination of Wittgenstein's language theory as an overall mechanism that steers our mind, together with Luhmann's autopioetic systems of communications, defines as socio-communicative autopoietic language games. It presents an overall abstract understanding of the social realm. It inheres all social actions that are worth taking into consideration in any given case. Like Forbes-Pitt, I also operate with the level of the ideally real. To Forbes-Pitt, the ideally real concerns human intentionality (an extended version of John Searle's concept of intentionality) and the general cognitive-ideal identity upon which this intentionality is based. My version of the ideally real, besides from the centrality of intentionality, integrates main points from the area of cognitive semantics as presented by Lakoff and Johnson (1999), Turner (1996), Fauconnier and Turner (2002), Shore (1996). Thus the idea of conceptual blends, blends in time and space, and Idealized Cognitive Models are understood as central to the intentional acts

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[16] Thus, the idea of the species "dog" is a product of nature. But the breading of particular races is a product of man at the level of the artefactually real.

of any user of technoetic arts. I do not agree, however, with the way Lakoff and Turner present their idea of cognitive building blocks, as well as their perception of time and space. A critique of their perception of time and space will be given in Part III, chapter two. The way I operate with a virtual reality level is also not equal to Forbes-Pitt's concept of the virtually real, which takes its point of departure in a digital virtuality. We find an idea of virtuality where the digital realm is understood as a reality realm in itself in Pierre Levy (Levy, 1998), and in Ascott's telematic embrace (Ascott, 2003). In this project, however, this digital level belongs to the artefactually real. The virtually real thus rather connects to Nature. It represents the intangible level of Nature that cannot be captured by referring to the materially real.

All presented levels of reality are inherent parts of Nature, because Nature is always grander than human culture and human thought. Here, I must emphasize that the distinction into a levelled reality must of course, in itself, be viewed as a language based construct, which aims to serve our intellectual purpose. In reality, these levels would be closely interconnected due to a dynamic, looped cause and effect relation, which would make it hard to place final demarcation lines, although they do present each their individual characteristics. And here we must remember that rhetoric and narrative structures are never equal to the reality that we seek to describe.

Once we have our ontological reality levels in place, we can return to our epistemological timelines. At the level of the superficial ontologies that arise as phronesis is practiced and explored as a part of a wider, socio-cultural establishment, which involves the development of the artefactually real through techné (skills and

technologies proper) and the socially real through institutions and habitual practices, a wide range of changes can be observed. These changes are connected to the three-dimensional level of a physical-material reality. The long epistemological timeline, however, is primarily tied to a relation between the virtually real and the ideally real, and has a much more lasting range.

An example that can illustrate the cleft between ontological truth and the material and social realities in a given society, could be if we interpret Plato's resentment of human art and techné as a consequence of the fact that there was, at the time, not equality between the nature of his actual insight, which was formed in a relationship between his cognitive properties and (including cognitive-semantic idealised models), which represent the level of the ideally real, and objects captured at the level of the virtually real. He thus realised that the possibility for expressing these insights truthfully through art, techné, and/or phronesis at the level of the artefactually real was low. This suggests a discrepancy between Plato's access to objects at the level of the virtually real, and the state of the arts of what was possible at the level of the socially- or the artefactually real at the time. By presenting the problem this way, I have indicated that thought can move from individual and social minds into matter, but also that individual minds can be more or less well tuned to levels of the socially and the artefactually real at any given time and place. This means that while there will be formations of collective consciousness in a society, the human subject cannot always be expected to be positively balanced with different collective formations at a level of cognition and consciousness. This premise leads to the assumption that there can be a variety of types of discrepancies between individual and the socially- and the artefactually real, a relation which is relative in the relation between the individual and

the given reality realms. This would especially be so because of our starting point in the contingent evolutionary and dynamic formation of social knowledge structures in a non-stratified society.

The language of knowing is typically developed and negotiated on the basis of dominant institutional paradigms and technological tacit knowledge, while pure generative philosophy might have a potential to reach virtual objects not yet captured and referenced in academic language games, or distributed in technologies. While having abandoned first philosophy, transcendence, metaphysics, and first person approaches, the situation today is that we do not have an intra-institutional philosophical intertextuality that can respond actively to such problems.

Chapter 2: The Epistemological Turn

4.0 Epistemological position of the thesis

From a preoccupation with the question of how academic and philosophical horizons have developed over time, and how concrete canons and their implicit lines of causation, together with the increase in disciplinary divides and exclusive vocabularies, and from a view upon the processes that have separated deep ontology from everyday scientific practice, I will turn to the contemporary context, where I wish to position an epistemological starting point for my own project.

So we are situated in the midst of a disciplinary fragmentation of thought, which we seek to overcome. Further than that, the integration of new media and digital computers in science, and in cultural communications at large, has, in itself, led to the necessity of new integrative vocabularies when one seeks to theorize the ways in which communication happens. Besides from developing at a fast pace, digital technologies influence upon practically all academic activities from research strategies to methodologies and distribution of results and further communication in the natural and the human sciences. The implementation of new technologies in lifeworlds affects ways of knowing and how people experience their everyday lives. And it makes new network connections possible, which were formerly under physical and geographical constraints. As this condition is to be intellectualized and integrated further into our theoretical contemplations, there is undoubtedly a demand for vocabularies that can cross fields, and allow for an articulation that can take the situation explicitly into account.

N. Katherine Hayles was one of the first theorists to direct attention to a lack of adequate vocabularies when it comes to the intersection area between analogue and digital media, and who sought to bring concepts from physical science into the humanities, in particular in her reference to chaos and complexity theory (Hayles, 1991; Hayles, 2002). She received massive critiques for her attempt at the time. The critiques are one example of the difficulties involved as one seeks to bring terminologies from one scientific branch to the other. Specialized scientists rarely favour the use of terms developed specifically to induce exactness in the language of their field, in what they consider a context completely alien to their own. It means that the very same term, developed to support exactness, gains another meaning because of its placement within a different context.

To get back to the influence of digital technologies on science and distribution of scientific results and insights (such as the nano-technology exhibition presented at the Los Angeles Museum of Art in 2003. Hayles, (ed., 2004), it is particularly the level of augmented- and mixed reality interfaces that form a point of interest in this project, mainly because it brings with it new levels of embodiment to the reading process, and it complicates our understanding of the constitution of the material world at the level of the artefactually real. Lakoff and Johnson's metaphor theory (Lakoff & Johnson, 1999) took its point of departure in a three-dimensional physical world, with artefactual objects; however, digital and electronic augmentation was not taken into account. Digital augmentation at socio-cultural levels gives an extra dimension to the interaction process between human and world, and inserts extra layers in the experiential process

from which metaphors can arise: because embodied interaction now happens in a world loaded with digital virtual objects that are in themselves mediated and metaphorical. Thus, embodied experience is no longer as simple to understand as if we view it only in relation to the body and a world of non-computational, non-virtual, static objects. This is also a reason why I do not find the philosophy of Maurice Merleau-Ponty (1962; 1963; 1964) directly applicable, although his work of integrating a wider understanding of perception and embodiment, and thereby intentionality is an important movement in phenomenology that, to some extend, can address certain issues concerning embodied interaction. Furthermore, according to Forbes-Pitt, more advanced stages in the development of digital interfaces and Information Technologies for public purposes present a general appeal to users that make them act as if technological interfaces presented a level of agency. This is what she calls *the assumption of agency*. Embodiment in reading processes, and assumption of agency, all changes the way the reader cognitively and intentionally relates to the text. "Text" is one of the central concepts in this thesis that allows me to observe installations, organisms and other conceptually drawn distinctions and relate them to each other. So already here, we can make clear that *text* is understood as a broad term that encompasses multiple kinds of communication. I will write more about the concept of text in chapter three, which carries the title *Technoetic Arts*.

Further than that, digital technologies have offered the possibility for approaches in writing and knowledge generation, which are based on advanced modelling, and which is generally of a more creative and forward directed kind (such as design), as opposed to

the retrospective orientation typically presented in academic print theory. This is so in particular when it comes to art-science distributions of new knowledge. Modelling and creative integrative solutions brought by through digital technologies forms yet another consequence of the new situation that places demand on existing vocabularies to change and/or expand. Having this situation in mind, it is fair to say that many research questions that could be relevant today, and which are founded on disciplines that actively integrate new technologies, demand theoretical conceptualisations that are transdisciplinary, and can stretch over the level of forward directed creativity that new technologies allow for.

Don Ihde (2009) is one theoretician, who has taken this problem actively into account. Ihde has proposed an epistemological point of departure that commences at a point later than the phenomenological philosophies of Husserl (1988; 2001), Heidegger (1977) and Merleau-Ponty (1962; 1963; 1964). In order to form the post-phenomenological position, Ihde integrates philosophy of technology, which changes the basic conception of how we, as humans, are situated in the world. Heidegger did consider technologies to be a central element in a phenomenological "dasein". However, he was first and foremost critical of new technologies (Heidegger, 1954). To Ihde, perception and embodiment is understood as intimately related to the use of technologies, also at a level of scientific epistemology. Ihde uses astronomy as a case study, where recent inventions of telescopes, satellites and robots that can travel in space, have become central instruments for extended perception and conceptualization. With spectral analysis, for instance, it becomes possible to perceive light frequencies, and complex patterns of

light frequencies, which are then transcribed into chemical formulas for further analysis. These chemical analyses decide our understanding of physical conditions on planets, stars and galaxies far from us. We cannot come to these results without the technologies that allow an extension of the capacity of our senses as of now. Technologies thus mediate our realities. The main claim, as opposed to Latour, who focussed mostly on processes of scientific practice, is that the immediate, phenomenological experience of human beings, also in lifeworlds, is being viewed as augmented by advanced technologies, and that this changes our phenomenological point of departure. The intimate connection between technology, perception and cognition forms a central point, when talking about the epistemological turn as an advent worthy of taking seriously into account.

For now we can conclude that we have a two-sided problem, which concerns disciplinary fragmentation on the one hand, and a state of the arts that tells of a socio-cultural condition where digital technologies have become almost symbiotically integrated inscriptions (to borrow a term from Bruno Latour, 1979) in experiential processes. So there is an overall need to generate frameworks that can bring philosophy of science forward into an integrative form that can also take into account the influence of new technologies on processes of human knowing.

4.1. The four epistemological pathways as background for a new, semiotic starting point

Before I move further into considerations concerning new technologies, I will present our epistemological problem in the spirit of chapter one, with the aim to point towards a new starting point as opposed to the directions of former epistemological pathways. After that, I will return to a treatment of the problem connected to digital technologies, and how these affect epistemologies, ways in which we experience and come to know.

Søren Brier (2008) has in his cybersemiotic theory characterised the overall development of Western epistemologies in what he calls the *cybersemiotic star*. The cybersemiotic star is a model in which he presents four major epistemological pathways that have historically been taken in the knowledge cultures of the Western world. The four pathways are: embodiment, coupled to organic evolution (which relates to the life sciences and biology), physical nature, coupled to Big Bang cosmology (which relates to physics), the other and language, coupled to the history of culture (relates to cultural-, social studies, and art studies), and the inner mental world, coupled to existential development (which relates mostly to philosophy). A main point in Brier's theory is that theoretical speculations ought to take their starting point in the middle of the cybersemiotic star, rather than in one arm only; and it is important to not let any one arm of the star dominate, when it comes to underlying ontologies, which form a foundation for explanations. The starting point, when one begins in the middle of the star is overall semiotic, as opposed to the current situation, where physical science and a materialistic positivistic world view has generally been viewed as the most basic scientific discipline. This has coloured explanations in fields other than those of

physics. It is so in particular because the Big Bang theory explains the universe from it's beginning, where human biology, mind and culture are viewed as late appearances. If the Big Bang theory is close to truth, then, it follows naturally that physics is the most basic science. Before human mind came physical and chemical realities, processes that led to the formation of dust, the gradual formation of stars and planets, and, eventually the appearance of Earth, and then, eventually, the formation of organic life from simple bacteria, and late in that process: the human species. For this reason, all other disciplines are dominated by the basic approach of physical science, and this domination has been a part of what forms scientific (and philosophical) epistemologies today.

Brier proposes a starting point, where questions and solutions are sought in an act of careful extrapolation from each of the four arms of the star, working out integrative transdisciplinary narratives (use of the word narrative is mine, not Brier's) on this basis. This means that physical science and its ontologies and conclusions do not have any immediate domination over explanations in any one of the four arms of the star, or over the holistic, integrative theories that follow from this approach. When it comes to exact methodologies, none follow from the cybersemiotic paradigm as of yet, because the theory is still in need of further intersubjective negotiation in relevant academic communities in order for actual methodologies to be derived.
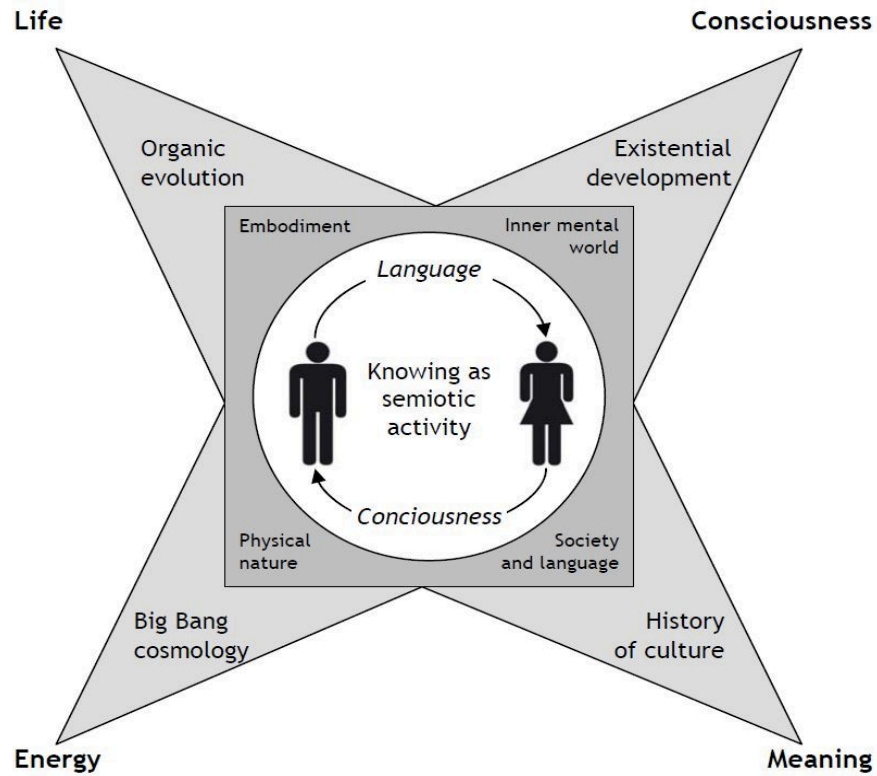
Figure 2: The Cybersemiotic Star

To start a research process in the middle of the cybersemiotic star involves a state of insecurity. It does so, because the semiotic and transdisciplinary ontological starting point, which represents an equal value of each four arms, has not yet been tested, not even by Brier himself.

So, we have localised a problem concerning our ontological and methodological starting point, which, however, justifies the choice of a forward directed exploratory methodology and an emphasis on articulation, words and loaded terms, rather than a retrospect orientation built upon analysis through critical argumentation. Besides from this, we also have to place our insights concerning the post-

phenomenological situation in accordance with Brier's star. The Italian Engineer, Giuseppe Longo, takes a slightly different perspective on the problem of how new technologies affect the process of human knowing (Longo, 2009). Longo considers the problem from a perspective of engineering practice. From this point of departure, he writes of the relationship between the role of theory (with Aristotle: theoria) versus the role of practice (with Aristotle: phronesis), which he finds to change drastically with the central roles of information and communication technologies in science and society at large.

4.2. The impact of new technologies and technoscience on human knowing

Longo has suggested that the development of information technologies, and their role and level of complexity in practices of engineering, are causing what he calls an empirical turn, which first and foremost relies on the experience and accumulation of knowledge that arises from the very process of developing new technologies. In this understanding, knowledge is not only derived through theoretical speculation. It is as much generated in the course of carrying out practical processes relating directly to the invention and use of new technologies (the level of the artefactually real), whereby existing technologies and new inventions are mixed in a work form that he calls bricolage. Bricolage is a creative forward directed design process, where existing and new components are mixed into forms with a new and different potential. Such creative processes generate new experiences, which become part of an epistemological horizon. This is especially true of engineering processes, but also of processes in the newer sciences, such as for example nano science and synthetic biology. This level of experience affects the epistemological situation of scientific institutions further. Longo

claims that engineering is not just applied science. It has a progressive nature and a logic of its own that extends from the knowledge that can be derived in theoretical practice. In this way, engineering practices that are preoccupied with developments of new technologies gain an epistemological effect. Thus, according to Longo, they become part of the knowledge generation process itself. They augment our knowledge, and present yet another indication of a shift in epistemological pathway. The pathway that integrates developments and creative practises based on new technologies directly into the epistemological horizon is not presented as a pathway in itself in Brier's star. And the practice of developing new technologies as a part of the generation of new knowledge is not made an explicit problem in Brier's cybersemiotic theory (which does, however, have a whole section connected to library science and information technologies).

In Longo, technologies and creative design are placed in the center of epistemological developments, and this results in a shift in the role of science and speculation as the main area in which knowledge has been typically derived. Longo's main claim is that whereas theory has had its legitimation as prior to technological development, today, technological development and wisdom in practice overrules theoretical practice in fastness and scope.

In my view, Longo's article does not form a proposal that rests upon fetishism of technology. It rather presents a practical implication of the current technological development. Longo's suggestion places engineers, designers, and artists in roles, where we must understand their work to deeply affect the overall epistemological situation, and question the dominance of theoretical science. The

important part of this claim being, as I see it, the fact that creative, forward directed processes gain a wide influence, when it comes to attaining new knowledge.

I find that Longo proposes a legitimate claim that is worth taking into consideration, when one is trying to understand how knowledge is developed at a level of episteme. If Longo is right, then current epistemes would have transformed from mere literal discourse to tacit knowledge of inventors and users, negative effects being internet protocol (Galloway, 2004), for example. The development of the artefactually real to involve so-called intelligent technologies (and the engineering processes of inventing new technologies and creative strategies on the basis of specific technologies), does make an impact on human experience at both intra- and extra-institutional levels. Underlying the idea of an epistemological turn is also the insecurity of the state of the arts of institutional divisions into faculties and disciplines, and interferences between social sub-systems (science, politics, law, art, all negotiated in the Agora; the market place) that seems to be a growing unresolved factor in contemporary, global societies. The latter is presented in part by what I referred to in chapter one as power negotiation in the Agora, the post-academic situation, and newer discussions concerning the relationship between art and science.[17] This adds new problems to the problem of epistemological pathways presented by Brier's cybersemiotic star.

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[17] With frequent discussions in the MIT Journal *Leonardo* on the possible intersection between art and science today as an example

It is the general impact of new technologies on practically all human knowing that, in my experience, has left traditional philosophical canons without a genuine potential, even if relevant philosophies of technology, embodiment, metaphysics of/and time, and linearity as a problem in knowing (Heidegger, Ponty, Bergson, Deleuze, Guattari, et.al.) can still add to the overall picture. No single philosophy presented, however, can truly encompass the equation that brings together human and technology in a close relationship that affects both parts on a mutual basis. This is probably so, because they have been thought out at times where the computer and social media did not exist in the form that we know it today, and thus in a line of discrepancy between the virtually- and ideally real that they reached at the time, and the artefactually real that forms the conditions of today.

By reference to Don Ihde (2009), however, I would like to point out what I regard as a change in ontological position of these former philosophies. It is that phenomenology as well as philosophy that explicitly considers intuition, metaphysics and evolution, is today being implemented at a practical level (phronesis) by conceptual inspiration and application into the design of new creative interfaces, or in digital and technoetic arts. As central ideas of such philosophies (in particular the ideas of embodied phenomenology by Maurice Merleau-Ponty) are expressed, tested and used at a level of tangible or digital virtual and electronically (or bioengineered) material bases, ways of experiencing them change drastically. It is simply not the same to write of a possible biological energetic entity called a *bion* (Wilhelm Reich's idea of a micro-level, bio-energetic entity that operates in living organisms distributed in Adam Brown's artwork, *Bion*, which will be discussed in Part II, chapter one.), and, on the other hand, to test the idea of the bion through a dynamic, kinetic material sculpture that

demonstrates the possible behaviour of bions in real life, and which can be experienced by embodied interaction. I am not hereby indicating that the exploration of philosophical concepts by technoetic art demonstrates a truer version of the concept. I am rather suggesting that the testing of ideas in real life processes in the form of cultural artefacts present a new level of the artefactually real, and they present, when they are at their best, a combination of existing ontologies with new ontologies, presented in material forms. I will treat the topic of technoetic arts and its relation to the different levels of reality in Part I, chapter three, and in the respective case studies made in Part II of the project.

It is today possible to find genuine philosophical speculations relating directly to the Natural Sciences (such as David Bohm in physics, and Rupert Sheldrake in biology, both of which we must notice, have not formed their philosophies as part of an intra-institutional, academic practice, because they have both been at odds with contemporary mechanisms of inclusion and exclusion at the level of the scientific matrixes to which they have belonged). Recent philosophies which relate to the different branches of science, such as for instance philosophy of physics, philosophy of biology and the Natural Sciences at large, along with philosophy of art, which implement technology and the state of the arts of the information society, have not truly been canonized within the field of Philosophy of Science at the present moment. One consequence of this is, I find, that philosophy has, at an institutional basis, lost its power to ask and re-ask questions of our common ontological and metaphysical foundations in an original way. Institutional philosophy today is without a true potential to take up the important and

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necessary tasks of speculating once more about the deep questions of what truth is, what human knowledge is, and how we relate to the universe at large, if we no longer rely on the Big Bang theory and physical science as the dominant ontology and epistemology upon which all other explanations can rely. And at the same time, such questions have been discussed for instance by quantum physicist David Bohm, and in the new fields of semiotics and biosemiotics, some of the central questions of Philosophy of Science concerning how we know and what constitutes knowledge are being asked again (Deely, 2005). This means that one has to look outside the departments of philosophy to find theories that are applicable when taking up these questions in a contemporary situation. It is necessary to gather these genuine, philosophical contributions at a basis that is fully open and does not make a divide between disciplines or intra- or extra-institutional positions.

4.3. Epistemologies based on print culture and Information Technologies

It is the transfer of systematised intuition, rationality and overall insight into creative, material and social levels of reality that makes the difference, when it comes to moving through former philosophies, or seeking a platform from which to think philosophically. I am thus not only talking about assimilation and internalization at the level of a socio-cultural collective state of mind, when it comes to the argument concerning the usefulness of philosophies such as those presented by Bergson and Ponty today. I am also talking about the time span that exists from the advent of a mental concept to its creative expression, where knowledge is assimilated at a material level. This level is an important part of the modern, Western semiotic landscape, since artefacts and small environments with intelligent and responsive behaviour become still more ubiquitous.

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Longo claims that human beings develop through intersubjective, socio-cultural exchange in symbiosis with technological developments. By taking a semiotic perspective, I argue that the developments of cultural artefacts and communicational expressions in symbiosis with new technologies must be viewed as a higher degree of complexity in the patterns of cultural semiosis. Cultural artefacts and communications would involve all from artistic sculptures, robots and new inventive interfaces, to the architectural design of public spaces, libraries, educational spaces, and art or science museums.

Whether one is opposed to technological developments or not, one thing is for sure: creative, technological invention, and the augmentation of everyday situations of communication will hardly stop. And the state of the arts is already so that academic fields, in particular the social and human sciences, necessarily must take this development properly into account. In particular when it comes to ways in which they affect, and are affected by, our individual, intersubjective, cognitive and conscious minds. If cultural developments will continue to involve still more advanced behavioural sculptures, responsive architectures, and face and speech recognition interfaces, to place but a few examples, our signification spheres will become significantly different from those of our ancestors. I have here used the term, *signification sphere*. The term stems from Brier's cybersemiotic theory. It implies the total amount of significations produced by members of a given culture, on the basis of their specific umwelts. What is particularly significant of the signification sphere that I seek to characterise is that it has a high level of materiality, and a shorter time frame

between mental thought and material manifestation of that self-same thought. One characteristic of the artefactual level of the signification sphere is, thus, that it is both complex and "alive", full of interaction interfaces that are generated on behalf of human experience, mental concepts and accumulated skill. And furthermore, because there is a fairly high level of creative expression, it seems fair to expect that we will, continuously and to a still higher degree, interact with projections that stem more or less directly from us. To a still higher degree will our cultures present an image of our own thoughts, imaginations and desires, and we will interact with them as objects external to ourselves. For this reason, it is central to increase self-awareness, which concerns being aware of the prerequisites for the cultural signification spheres, and the thoughts on behalf of which, we create. Therefore, I talk not only of self-observation as presented in Qvortrup's hyper complex society, but of *extended self-observation*.

A culture of knowledge, which was centrally based upon a culture of print book communication, is today being transformed into a culture of knowledge, where knowledge is also materially embedded. This extends our ways of communication in opposition to a time, where the print text and spoken rhetoric were the main medium. It also presents a time where not all knowledge retrieved is written down, or formed in accordance with the rhetorical tradition of linear print textuality.

As viewed from a perspective of semiotics, and at the level of the individual, we could say that the more creative and expressive freedom individual humans in a society gain, the more they are able to not only understand, but to signify on behalf of their own umwelts, and their own understanding of such. With a personal interpretation of a

concept from biologist Jesper Hoffmeyer, who is a central contributor to the new paradigm of biosemiotics, I could say that individuals gain increased *semiotic freedom* with digital technologies, which involves tools for mediated distribution of personal communications offered at fairly low costs (book print, video distribution, blogs, social media), and free expression through social media. As individuals gain a higher degree of mastery over their personal creative expressions and understandings, and over their personal access to information, it also becomes necessary to extend the degree of reflectivity that is now needed to navigate society and which already increased with postmodernism. Taking the constructivist element of the formation of societies through language seriously, we could say that with increased semiotic freedom follows increased responsibility, because no matter how small you are, and as Massumi argued, theoretical formulations become productive of society. This is where the moral philosophy of Aristotle, involving philosophy in practice, also called "phronesis", could be reconsidered. Even Qvortrup (2003), through Luhmann, operates with the functional necessity love and trust in social communications, although traditionally, these phenomena are related to moral and ethical questions. And to Habermas (2001), the enactment of Kant's practical reason in the lifeworld was essential. So, while expecting love and trust to form central functional elements that optimise social communications in a society with higher degrees of semiotic freedom in the lifeworlds, it is fair to expect a necessity of individuals to enact practical reason in order to generate a "good" society; which was important to both Aristotle and to Kant, but which, by leaving ethical and moral questions out of science, we seem to have forgotten. While the assembly of individual nodes in a social network could be said to form an overall living structure,

we must expect this living structure to emerge on the basis of the choices made in the contingent space of idiosyncratic individuality.

Thinking of Massumi's (2002) reciprocal relation between the evolution of culture and nature, we understand that we cannot separate nature and social networks in any definitive ways. After Postmodernism and a domination of constructivist approaches in the social sciences, this idea is, however, rarely taken into consideration in social network theory[18]. But we can allow ourselves to hypothesise that in handling individual semiotic freedom, as well as combining individual semiotic freedom into common signification spheres, the relation to the wider nature in which all these networks are an embedded part, does become essential to re-consider. Defining and solving the problem of the climate crisis is one example that clearly shows how collaborative, cross-planetarian solutions are necessary. We can name this kind of action "collective intelligence". If societies over the globe are to seriously cut down CO2 emissions, there is a need for collective action, where individuals can perform self-reflectivity (this kind of decision demands reflective action in each individual involved), and from here a re-evaluation of the ontological understanding of human versus nature; because, as we have now seen: nature strikes back. Social processes *are* directly reliant upon processes in nature.

While individuals in Western societies gain higher degrees of increased semiotic freedom where they can enact and develop ethical and moral kinds of reason, the paradox is that rational and instrumental paradigms still dominate at the institutional

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[18] For instance Taylor, 2001

level: which includes academia. However, already in 1987, Peat and Bohm wrote of the repression of creativity in thought by the academic system. They suggest that creativity does not only belong to the genius, but is a potential in the individual if the academic system would encourage such strategies in institutional work and education (Peat & Bohm, 1987). To regard such a problem, we need not necessarily return to Horkheimer and Adorno's cultural pessimism (1987). Because suppressed creativity might have a different face in the networked knowledge society of today, than it had in pre-war, industrial societies.

These are but two examples of why it is important to establish a self-reflective philosophical meta-consideration. And in a time of deep paradigm shift, this consideration needs to be more than science, more than politics, more than economics, and more than existing social norm: it needs, in its first instance, to be philosophical.

What I want to suggest, is that even in a time where new technologies become a kind of knowledge in themselves, and practical development becomes part of the epistemological tradition, philosophy could still be viewed as a way of speculatively imagining, before actualizing ideas, or in research, before being able to materially verify or pragmatically make use of philosophical thought. As Nicolescu (2002) writes, the quantum level of the world penetrates our imagination, and at this reality level connects us directly to the external world; just like Massumi (2005), with many others, writes of the quantum level as delivering potential that can be actualised. Then we can say, for one: if some truth exists merely within the imagination; and if on the other hand contemporary developments in academia present us to new disciplines (digital design,

nano-technology, synthetic biology, practice based art research) that demand a forward directed productive methodology (Massumi), it is necessary to be able to conceptualize on behalf of the imagination. Here, I will suggest that there can be a range of discrepancies that rest upon our five levels of reality, which will mean more or less potential between philosophical thought and the socially and artefactually real, however, that a lot of artefactual manifestation is based on human imagination and desire (supported here by Punt and Pepperell, 2006). If there were academic research aimed to cast light on this topic, there would most probably be a range of new epistemes to be formed that cast further light on the relationship between historical speculative thought and their later manifestation into social realities.

So not only is there a shift in the relation between the mental substances that have been part of the mentioned fragmenting of knowledge, but there are now tendencies of new dynamic, cross-disciplinary and cross-institutional interaction patterns. What interests me the most here, however, is the transformation of thought from one kind of context, namely that of conceptual thinking at the level of the ideally real, into the empirical and useful application of the same kind of thought at the level of the artefactually real. Thoughts of the same quality, or of similar meaning, are being shared and applied in multiple ways of communication: as print theory, or as actual social structures and types, or as physical materializations. And in my view, if these lines of communication and mutual effect are to become implemented, philosophy is left with new occupations, new territories, and new thought geographies (to use a spatial-material metaphor) to establish.

There is, of course, a problem, which can best be described by the idea of the Agora, and the fast, communicational exchange rate between social systems. At concrete social levels, technoscience not only works; it is also often established in close cooperation with economical and political strategies. Areas such as Nano science, Synthetic Biology or Biological Engineering typically address needs for financial growth, which shows a tendency to, at times, overrule the humble, fallible goal of research to establish and negotiate truth on its own terms. One result of this strive is that philosophy and art gain less validation as research in itself. This can result in a closed horizon when it comes to understanding more of nature on nature's own premises, so to speak. Thus, the resistance to paradigm shift at the deep, institutional level could have a close connection to such circumstances. In a time of financial crisis, solutions that can support growth are valued over solutions that are less applicable to here and now situations. Thus, at the level of the Agora, the deep paradigm shift that this thesis claims is an essential part of the contemporary situation has not yet truly shown. And it is my thesis that philosophy and art play a role in formulating the first instances of the shift in ontology and general mentality that could lie within this paradigm shift.

Chapter 3: Technoetic Arts

5.0 Technology assisted art as a contribution to knowledge cultures

In the first section, I declared that this project is mainly meant as a contribution to the field of Philosophy of Science and as an inspiration to art practitioners. Further than that, it integrates Technology-assisted art viewed as communications with equal value to such of theoretical analysis and theory generation. The background for this choice lies mainly in the reasons argued for in the previous chapter, concerning the epistemological turn. Technology-assisted art is understood to add significantly to the evolutionary formation and development of social signification spheres. Social signification spheres are not only the product of human cultures. They also form a realm of experience for people who are immersed into them.

In the previous chapter, I chose to characterise signification spheres as being alive. By using the term "alive", I do not mean that they are alive in the biological sense. Rather, the term is used as a metaphor that refers to signification spheres as being complex, having emerged on behalf of dynamic structures, which are, in themselves, in constant motion; something, which is intertwined in networks, and which springs in and out of form, much in line with Latour's (1979) network ontology, except the main actors considered here are humans, neither things, nor machines. This leads me to suggest the concept "behavioural signification sphere". In this sense, signification spheres can be understood as a formation of any size, which can be characterised by having intentional behaviour. These behaviours arise at a supra-individual level. It is my claim that within

the overall signification spheres of intercultural, knowledge cultures, technology assisted arts would have a central place. They might not be materially, or even conceptually obvious as communicational exchange happens in the Agora. However, since I choose to keep a focus upon technology assisted arts, it is my aim to demonstrate how these communications can be viewed as texts that hold condensed symbolic information and reference to a current and near future state of the arts situation, concerning the place and character of knowledge in the signification sphere. They therefore distribute a kind of knowledge that cannot be found elsewhere.

If art is viewed as research, and as a contribution to knowledge generation at large, however, is not equal to scientific knowledge, it has a range of consequences for the overall understanding of the social realm, including the institutional level, to take this stance seriously. But before I address this issue further, I must define technoetic arts, which is a type of interactive, technology assisted contemporary art.

First of all, technoetic arts, which is the term I will end up using as I move through my case studies, is but one category of technology assisted arts in total. There are numerous other categories that could be referred to, when addressing contemporary art. Today we still talk of literature, painting and sculpture, as were they the first and foremost categories of art. But not only have they been challenged by something such as Sol LeWitt's conceptual art, or Nicolas Bourriaud's relational art; the classical categories are also developing and morphing into new shapes based on the active exploration of new media and technologies. The recent development does not imply, then, that there is no longer something such as painting, theatre or literature. It rather implies that the kind

of art that presents an equation where social evolutionary tendencies are in tune with natural evolutionary tendencies is not to be found first and foremost within these categories. By this I refer to a point of reference, where new dynamical objects come into expression in signification spheres, and which expand current experiential realms at the levels of the ideally- and artefactually real. I find this kind of expansive art to have better footing within the realm of technology-assisted arts than within traditional categories of art, because the implementation of new technologies often allow experiments with more complex structures, an altered sensuous interface appeal, a multisemiotic structure, and a composition that allows a connective and dynamic paradigm, also on the material side. This, of course, refers well to the epistemological turn, where technologies are understood to be a central part of cultural experience, communication, formation of new epistemological narratives, and ways of coming to know. On the one hand, there is a movement in art, where existing categories remain, but become augmented by the use of new technologies. On the other hand, there are categories that emerge directly out of the specificities of new technologies, such as mobile phones (telematic art), the Internet (internet art), databases (database art), biotechnologies (bio art) and more (Paul, 2003). Furthermore, technology-assisted art not only expresses and relates to contemporary developments in technology and science. It also, by its experimental approach, demonstrates, tests and produces metaphors that we (can) think by. In technology assisted arts, genres are not only developed at a rather fast rate, but many times genres overlap, transmute, and are combined through existing and new strategies, in still new creative ways. The fast categorical escape shows an invigorating sign of non- or meta-categorical creativity, when it comes to the institutional levels of knowledge. In this sense, recalling Adorno

and Horkheimer, we could claim that contemporary art is emancipatory in the sense that it escapes the fragmentation that Bohm and Peat complained of, and, at the symbolic level, it also escapes the two cultures of C.P. Snow, which Brier still finds to be a problem (Brier, 2008). I must mention that the perspective placed in this thesis is non-political, and in quest for truth only.[19] But I write this to illustrate how new knowledge sometimes needs to be emancipatory and anticipatory (pointing towards future directions outside existing mind-sets). It is well known that social structures, as productive as they might be in one period, can become rigid over time and place a too high degree of constraints upon the imaginative horizons that lie as a potential in any culture. Technology-assisted arts, when they are at their best, point towards a kind of emancipatory and anticipatory qualities. And our main point of interest here, when it comes to the social realm, is not to look for so-called innovation, which typically relates to instrumental social needs and market economy rationalities. It is to look for expansion of consciousness, how this expansion is expressed and can be evoked, and how it can lead to new knowledge.

Technology assisted arts can, in principle, be developed at an institutional level, or be funded by private institutions or corporations, and thus develop within existing social realms. Or it can be developed in more alternative settings. (Its production usually has a high cost, which is why it is necessary for many artists to receive grants or funding from corporations or universities). But the fact that funding is needed, does not necessarily direct the inherent symbolic value of the art piece; the last of which is what I am interested in. At this level, many technology assisted art works,

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[19] In the theory of the Agora, inspired by Luhmann's symbolically generalised media, the medium of science is truth, whereas the medium of politics is power.

point outside of any given existing system, specialization, or level of fragmentation in language.

5.1. Technoesis in the post-human society

I have chosen to define the kind of art that I use as case studies as technoetic art. Artist and professor, Roy Ascott, coined this term. It was coined in relation to a more general concept, concerned with new ways of understanding the social realm. In this sense, Ascott meant that we were on our way into a kind of societies that were coloured by a so-called technoetic condition. Technoesis in society implies a social and individual alteration of consciousness, which is mainly derived from the symbiosis between new technologies and human consciousness. This is not in the sense of trans-humanism. And it is also not equal to the posthuman condition, suggested originally by N. Katherine Hayles (1999). Technoesis includes art, but it is more than art art. It concerns all kinds of relations, private and public. It is the integration of technological developments with studies of the conscious mind as part of an overall individual and social expansion of consciousness. The reason Ascott combines the focus on techné with noesis, is that he finds that technologies, and in particular technology assisted art, alter human consciousness through their very presence and functionality. Because technological developments have been so central in Western (and non-Western) societies, the connection of techné and noesis has become of increased importance. However, Ascott is both early, and outstanding in his vision of the importance of how technologies can provoke states of extended mind, or extended cognition, a direction of which we can find many signs today.

In technoetic arts, there is often an emphasis on provoking common ideas of the five senses, proprioception, the reality of synaesthesia, or the borderline between reality and imagination; ideas by which we feel most familiar. And there is a main provocation of the idea that exosemiotic processes (the body's interpretations of external input understood mainly as a one-way communication) are always a priori in processes of experience and knowing. The aim is to both explore the human-artefact relationship, and how it expands and affects consciousness, and to explore more of the inner world of human consciousness. The noetic part points towards consciousness as an inner experience of the human subject. Ranges of theorists have attacked the issue concerning the effect of digital technologies on academia and the social realm, from different angles. As mentioned, N. Katherine Hayles (1999) gave an important input to the general academic discourse with her suggestion that we had entered a post-human condition within the humanities, where she came to terms with earlier humanistic conceptualizations of human subjectivity, and integrated some of the changes that new technologies made on society and academia.

Robert Pepperell (2003) is an example of a theorist who navigates on the edge between posthumanism and transhumanism. To some extend, one could say that he forms a representative of the concept of the transhuman movement, because he presents an image of the human subject that is symbiotically intertwined with technology. In this theoretical scope, humans enter the next phase of humanity with a range of technological implants that can heighten concentration, cognition, and general skills concerning how we know and do. In this thesis, however, the emphasis is not placed

upon how technologies alter human consciousness, including perception and cognition. I view technologies to play a central role, but my emphasis lies upon nature's creative invention: the flesh and blood human subject, and her relation to nature at large. This implies technologies, which are part of human signification spheres. However, as much as I find it necessary to take technologies centrally into account, I do not find that they are all encompassing. They creatively stir innovations in national and transnational signification spheres; but when it comes to technologies as knowledge, they can never be anything but reductionist versions of inspirations coming to humans from nature in a synthesis that relies on a mediated relation between the ideally real and the virtually real. Thus, nature's inspirations are of a different kind than human inspirations. However, there is a link. This link is based on communication in a semiotic sense (Peirce and cybersemiotics). I will move further into this subject in chapter four on cybersemiotics, and my reference to the philosophy of Charles Sanders Peirce, and my choice of a semiotic, phaneroscopic ontology (in line with Brier). For new knowledge to come into formation, it demands openness towards the virtually real. This openness is difficult to establish in environments that do not accept the abductive properties of the imagination, and the open horizon of a natural non-religious inborn spirituality (where "spirituality" is understood in a sense close to what Nicolescu, who will be referenced below, has described as an openness towards the excluded middle and "the sacred") as part of what it means to be human.

5.2. In Vivo Research

One reason that readings of art works could contribute to insights of the knowing, human subject is that the kind of art that I refer to, typically represents the quest for

knowledge with equal passion as genuine philosophy that seeks truth or questions the preconditions for truth anew. And because technoetic art as research is just as up front with innovations as is scientific research, and more traditional scholarly approaches, as I see it. In fact, technoetic arts often explore territories that have been abandoned by mainstream science, because they do not fit into accepted paradigms. In this sense, technoetic art has a potential for deriving new knowledge, or to point towards central questions that we need to ask, or to say it in the terminology of Donald Rumsfeld: it turns our attention towards that which we don't know, and that which we don't know that we don't know.[20]

Thus, as an alternative to the exact sciences and the methods of empiricism, I suggest that technology assisted art can be seen as research in line with science. It works in the crossover fields of the two cultures (humanities and natural sciences). Its techniques are, in part, based on technologically aided simulation, that can symbolically exemplify in vivo research based on modelling, experimentation and exploration. One of the main materials is, as I view it, not just the aid of new technologies when it comes to expressing new thoughts, but rather *the concept.* Being preoccupied with exploring the nature of a concept concerns and touches upon the processes of how we make *meaning* in the signification sphere. And in the installation, concepts and meaningful relations are tested in a material realm. Thus, we could say that objects of the ideally real are transported into the artefactually real. If the artist is inspired, we could further say that the line between the virtual-, the ideally- and the artefactually real, concerning the

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[20] This is an inspiration I got from Brier (2008), who cited a poem by Donald Rumsfeld, concerning what we know

particular concepts in question, are tested by forming the installation, and finding out what means and which functionalities are central in demonstrating the concept in a real life material form.

To understand the consequences of viewing technoetic arts as research better, we might have to alter some prejudices derived from research practices in the exact sciences. Basarab Nicolescu (2008), a Hungarian quantum physicist suggests the concept of *in vivo research*, which seems to suit our purpose here. In vivo research is a dynamic research process that integrates the subject observer directly in the process of objective observation. It does not undermine subjective positions, or the possibility of an explicit research subject as part of the creative process. It does not undermine objective observation either. Actually, objectivity becomes an implicit part of subjectivity. Objectivity, then, becomes one particular way in which the human subject relates to the world among others. Furthermore, in vivo research emphasizes understanding rather than fact and result, correlations between intellect, feeling and body rather than analytic intelligence only, and inclusion rather than exclusion of values. All of which is opposed to the positivist domination of large parts of the natural and social sciences. In vivo research is creative. It is oriented towards 'astonishment and sharing, rather than power and possession' (Nicolescu, 2008, p. 3). In this way, Nicolescu presents a set of qualities that characterise in vivo research in opposition to in vitro research. In vivo research demonstrates a change towards more process oriented, non-reductive approaches. In Vivo research is a prerequisite for transdisciplinarity, according to Nicolescu, who claims that interdisciplinarity and multidisciplinarity are not equal to

transdisciplinarity. To characterise transdisciplinarity further, Nicolescu operates with the concept of *the excluded middle*, and a partition of reality into different reality levels. One level of reality could be material reality based on an atomistic viewpoint that morphs into irrevocable paradox, which, in the zone of non-resistance allows for the next level of reality to appear. This means that paradox and being stuck within a semantics based on binary opposition, where paradox and the upheaval of common binary oppositional pairs are banned in classical logic, are, in principle, overcome, and this is how the excluded middle is taken back into consideration. At the level of quantum reality, the laws are basically different than at the atomistic level, however, the two levels of reality co-exist in a complementary way. Nicolescu's conception of in vivo research, further than serving a justification of technoetic art as research, functions to justify and explain the quality and role of our generative philosopher.

Even if Nicolescu suggests levels of reality according to physical science (which is his major topic as a physicist), I have, as presented in chapter one, chosen the levels of reality inspired by Forbes-Pitt, and have extended those with new understandings and extra levels as well. Classical positivism and empiricism would typically focus upon one level of reality, the relationship between the so-called objective self, and the materially real (all three dimensional material objects in Nature). If research takes into account several levels of reality, its interpretations of results will be different by nature. I will seek to provide the evidence for this through my work with eight artworks under five overall themes in Part II.

Much technoetic art research inheres qualities that coincide Nicolescu's conception of in vivo research. Technoetic art practice is typically based on a combination of subjective intuitions, experience made from fields of empirical science, and the techné of engineering. It communicates by the semantics of aesthetics, often integrating both informational and semantic properties in interesting relationships. Art research often implements and tests central, philosophical questions and spiritual intuitions as part of the conceptual background for the work, of which we will meet examples in the case studies. But its aim is similar to science: it seeks an expansion of our understanding of the world at large, of our placement in it, while simultaneously investigating a creative, forward directed, manifesting potential. The true accomplishments of art research, however, seem to be more such of raising and directing attention to the best *questions*, rather than seeking the best or most accurate answers. To a certain extend, one could claim that one of the tasks of art research is to *direct attention*. The act of directing attention could, reciprocally, become a source of inspiration for theory and for empiricism happening in a process based loop of mutual inspiration between art, science and philosophy over time (in certain non-linear, causal relations). Now, this approach can only be interesting if we realize that knowledge is always provisional, and that we are immersed in never ending processes of learning, knowing and creating. We are, in these processes, developing our socio-cultural signification spheres, and, hopefully, there is a potential for refining the relationship between nature and signification spheres into higher degrees of mutual sustainability. However, if we view knowledge as part of our relation to nature, and as a non-final process of becoming, then the task of directing attention to issues more potent than others by art research, becomes of increased value.

5.3 Matter communicates
-On Research by design of Augmented Realities

In the common use of the concept augmented reality, inorganic matter and culturally produced material can gain dynamic and behavioural functions by becoming augmented with electronic and computational properties. If we choose to call the information processing elements of large and small-scale digital computation *intelligence*, then we could say that matter becomes augmented with computational intelligence, and gains behaviour. But the mere augmentation of matter by the use of new technologies alone is not what makes art making a research process. The main characterization of art as research, in my view, has to do with the element of exploration, the close tie to science in the quest for knowledge, and the interest in the main ontological questions, such as what is life, and what is consciousness? What is perception? And what is nature?

As a terminological tool, I choose to call the technoetic art installations that I work with, *text*, also when the installation involves multiple geographic locations that are combined via the Internet or the implementation of mobile phones. The art text communicates of the artistic explorations made through the process of making the work, which often imply levels of ontological, intangible insight that are not usually presented, and transferring this insight into the realms of a material kind of cultural semiosis. Because this project places value in an estimation of the closeness of the relationship between intuition, thought, and material manifestation, this point is important.

Now, I am not claiming that all that art does is to make scientific or philosophical investigation. But it does seem to be a major part of the process for many artists, and I am deliberately choosing artworks, which I consider to deliver new knowledge. Furthermore, it is my thesis that although artists may not have made it clear to themselves, there are always symbolic levels in the artwork that communicate and refer to ways of meaning that the artist themselves might not have thought of, because they never sought to interpret their own work at higher, symbolic levels. However, in order to interpret technoetic art installations that might be interactive, immersive, ambiguous and non-verbal, some further theoretical tools are needed.

All in all, a main part of the project itself is to find and establish vocabularies, and make meaning in ways that expand the way we could otherwise understand the contribution of the artworks to knowledge generation. As one of my intellectual tools that shall help me generate a theory of the human subject, and more concretely to interpret artworks, I will seek to characterise an *ideal user*. The aim is that the ideal user gradually forms throughout the project, by combining all three parts of the project. What is useful to say at this moment is that the research process concerned with art happens at a practical level, much in tune with the idea of bricolage, suggested by Longo. In this sense, terms, concepts and functions are tested and explored in their relational form, in a completely different text form than for instance if written philosophy explores a concept and an idea of dynamic relations. And even if the wet organic matter of living organisms like ourselves or like animals, and the dry artificial nature of technology assisted texts will always be different in ways that cannot be overlooked, there is still a testing of dynamic

functionalities and structural relations, which cannot be made in the same manner in ordinary, empirical research within the fields of the exact sciences. In this respect, the dynamic aspect of in vivo research is essential, together with the specificity of communication across concrete, metaphorical and symbolic levels of the objects inherent in the installations. I will return to this aspect in my readings of artworks in specific case studies, where I will tie my readings closely to the sign systems of Peirce, which I have found to be partially useful when it comes to approaching works from a hermeneutical and semiotic perspective.

5.4 Technoetic Art as text

Why have I chosen to work with a concept of text, when many of the works that are part of my case studies are works that use interfaces of augmented and/or mixed reality, and processes that involve users and artist in ways, that can hardly be framed?

One could argue for the concept of text as belonging more to symbolic communicational forms that are connected to traditional print-text, like websites for instance. However, to me the concept of text will work as a frame in which to explore the communicative potential of the given work. Without a firm frame of communication it becomes impossible to name and investigate important issues in the works. It is furthermore my opinion that all art works are framed, even when they are process based, dynamic, immersive, ambiguous, and, to some extend, provide behaviour that is unpredictable. Since I want a reading of text to be both diachronic and synchronic, which means that it can be experienced within its topological frame, it cannot be done without a clear division between the artwork and the environment in which it is read. I

will, however, in a section devoted to this special purpose, make an outline of a theory of relativity that is not based on physics, and which can be applied to this project, since the issue of spacetime relativity is essential to all my observations. This will play an important role, as I read texts. Together with *contingency*, and the idea of a *levelled reality*, the idea of relativity in narrative and meaning plays a central role in forming narratives of the human subject.

5.4.1 The parameters of the work as text

So what characterises the text that I want to categorize, at the concrete, noemic level?

Text is a designed property that merges techné and sign. Thereby we are operating in both a concrete and an abstract sense, since the techné of design is the concrete mastering of technology, and the design strategy and structure comes out as a semantic expression, together with the semiotic signs inherent in the interface. Any design demands a concept for its construction, and this demand increases when the process of techné becomes more skill demanding. The outcome of the design can be materially firm, presented in three-dimensional digital virtuality. It can be a text with single or multiple pathways. It is interactive in its communication, affecting the user, who is in turn affecting the text back in a looped communication process. It communicates in multisemiotic and multimodal modes, thereby integrating the semiotic system of letter writing with pictures, sounds, haptic and/or kinaesthetic appeal. But it also communicates by appeal to the senses, affective and aesthetic appeal.

This concept of text does not apply to print text, which has only a low degree of physical interactivity, no computer virtual side, and often little multimodal appeal. The print-text appeals in what could be called a philosophical virtual (inspired by Roman Inngarden, 1973) way to some of the sense-modalities, since the experience is not a full, multimodal phenomenological experience that includes a broader, haptic appeal as well. We can find likely understandings of the multimodal, digital text in Günther Kress (2003), and to some extend in Heibach (2003), and in Pold (2004). Print-text primarily communicates by few semiotic modes, whereas this text communicates by multiple semiotic modes. Academic interpretive readings of multisemiotic and multimodal texts must be made in crossover fields connecting verbal language, pictorial language, sound, and haptic appeal that in connection form new, semiotic patterns. Common traits of multimedia text are also affective and aesthetic appeal, where *aesthetic* can be understood at both a deeper, philosophical level, as well as a concept of symmetric order in otherwise complex or chaotic levels of semiosis.

5.4.2 Text as cognitive framing

I have now presented one level regarding text. However, there is another one that has to do with our nature as expressive human beings. More than the concrete proportions and dynamics of the text, one could point to a notion of text, where text becomes a cognitive, operational act. I will, at a preliminary basis, describe art as an operational mode in which we by techné and mimetike mimic processes in nature by doing and by mediating the ways in which we conceptualize the self-same processes. But if this is art, then what is text? Then text can be seen as the way in which we give art semiotic expression in the communicative style of language. However, style in this context,

should not be understood at the noemic level, but at the noetic. This connects the concept of style to cognitive processes of the mind. It refers to ways in which we choose to structure experience, and communicate it as information. Then we have pointed towards two aspects of text that are complementary, and should not be seen as incompatible. They connect, as I have shown, to the noemic (naming the world around us) and the noetic realm (inner experience). On behalf of these two sides of the text, we can operate analytically, when we are examining the technoetic potential of specific artworks to point to transformed ways of contemplating at levels of inner mind. We see, that there is, first and foremost, the natural, species specific ways in which human beings learn and express themselves as specific working modes that can be taken into use, and which would be placed, in part, at the level of the ideally real, and secondly the ways in which such modes are taken out in a physical-material manner, which would be placed at the level of the artefactually real.

The text is also a contextual space, and the word space in this definition can mean both a physical, and a computer virtual space. When I choose to read the intelligent art installation as a text, and look into its semiotic communication, at the same time I seemingly abandon the function of usability implicit in the work. Well, the functional use of the work is in my conceptualization integrated as the phenomenological appeal of the work that is meant to work in cooperation with the contemplating appeal of the work. Again we must see the complementary effect between phenomenological experience and contemplation. This complicates matters, as we shall see, because once again we have to ask of differentiated levels of establishing external and internal

attention. But remembering our quest to upheave the divide between subjective and objective levels: is this division fair and logic? Can we argue for the existence of such a division?

Peter Weibel suggests that the interactive artwork exemplifies the situation of second order cybernetics, where the observer is always an implicit part of what he observes. Weibel uses a reference to Otto Rössler's concept of endophysics (Weibel, 2001). The installation, then, becomes a micro cosmos, symbolizing the endophysical situation where the user (and the artist for that matter), establishes an overview over a communicational situation, which, in the real world, is too complex to make sense of, in part, because one is an immersed element in it. This looks like Qvortrup's hyper complex society, where social systems can do nothing but to self-observe, and where a privileged overview is not possible. When it comes to the installation, however, the user is never completely immersed within an artwork, and rather quickly learns to view it from a higher perspective in the situation. It is often possible to grasp the overall concept of the work, even if the components of the work are ambiguous. Grasping the concept leads to potential contemplation. And as we shall see in the case studies, our place in the universe as self-observing insiders could be constructively complicated if we gain increased understanding of processes happening at the internal levels, thereby gaining increased insight in relations between internal and external worlds. I will discuss this aspect of knowing in chapter four on cybersemiotics, and explicitly in case studies two, three, four, and five.

So far we can conclude, further than having established some of the central terminologies of the thesis, that we are in a process of a creative, forward directed attempt to make theoretical sketches of the human subject. We have found that communication is essential in the socio-cultural situation as well as in the art installation. We have also decided that the human subject is steered by processes far more complex and invasive than such of the rational, day conscious mind, which is why I will have a particular focus on the mental and psychological processes of the human subject that are not steered by day conscious rationality and it is why I am sceptical about the idea of the human subject as a confined egotistic entity. In order to become able, however, to talk about multiple levels of reality, and ways of communication that relate particularly to the five levels of reality, and in order to attack the problem presented in Luhmann and Qvortrup concerning the inspiration from functional explanations, and more concretely from the paradigm of information science, I will introduce the cybersemiotic theory of Søren Brier (2008).

Chapter 4: Cybersemiotics
- A foundation and tool for the development of the Ideal User

6.0. The Ideal User

Taking a hermeneutical approach to technoetic arts, which allows artworks to function as genuine research, evokes the necessity of establishing a firm foundation upon which an approach can be made. If artworks are to function as research, their interpretations must not be random. When working with technoetic arts, it is obvious that the kind of explorations made by art do in no way lead towards fixed or exact explanations. First of all, it is a question of meaning and understanding, rather than fact and falsification. And it is a question of working with concepts of reality, and to understand how basic concepts are to processes of knowing.

I have already mentioned that in order to characterise central signs of communication addressed to the reader by artworks, I need to identify an ideal user. Brier's cybersemiotic theory seems to deliver an overall complex scheme of conceptualisation that can grasp the many aspects of communication typically addressed in technoetic artworks.

I will elaborate on the most central issues presented in the theory of cybersemiotics in this chapter. Since cybersemiotics is a complex theory that thoroughly goes through a range of theoretical frameworks to reach its goal, I must introduce the theory gradually to the reader. When moving into the cybersemiotic paradigm, we transgress the theoretical frameworks of Luhmann and Qvortrup, which I introduced in

chapters two and three, and thereby Brier brings us to a next meta-level of observation. However, in Brier, central elements from Luhmann's social systems theory is kept, and play a role in defining the human subject and the socio-cultural environment that she inhabits. In particular when it comes to the autopoietic socio-communicative language games, which I have shortly mentioned in Part I, chapter three, and which will be treated as part of the presentation of the theory. Because the theory is so extensive, however extremely useful, I will dedicate this chapter to it.

6.1. An introduction to Cybersemiotics – Why Information is not enough

The cybersemiotic theory weaves together elements of information theory, cybernetics, library and information science, ethology, biosemiotics, cognitive semantics, social systems theory and language philosophy upon the ontological background of Peircean semiotic philosophy. As it does so, it transgresses each framework that it moves into, except the philosophy of Charles Sanders Peirce, which is kept intact as an ontological background for the project. We must note that Brier's choice of paradigms is in no way random. He chooses the theories that are most pervasive and dominant in the current theoretical landscape. But he generates a meta-understanding, while viewing these theories from a new level. The result is an overall synthesis of the most central and useful parts from all of the mentioned paradigms, when it comes to answering questions of communication, cognition and meaning.

The integrative method is thus one that generates new levels of meaning. I find this essential in a time of information excess, with many contributors, a high degree of

availability, and a high degree of redundancy and repetition in available material. The only way to avoid an excess of repetition, when it comes to central philosophical points about human cognition, communication, meaning and consciousness is to transgress the borders of current meaning making, and to move into meta-level observation. Cybersemiotics meets the thesis directions in this strive, which makes it a theory adequate for dialogue and further development of my own theory.

6.2. Cybernetics and Semiotics in one paradigm

The essence of the cybersemiotic paradigm is, in my view, the integration of cybernetic and semiotic principles into an overall conceptual model in which the two paradigmatic frameworks, otherwise divided by institutional specialization, become integrated and must be regarded as complementary rather than oppositional. The cybersemiotic theory offers a suggestion of a unification of different approaches across the natural, the social, and the human sciences. It also offers a vocabulary with new semiotic terms based on the inheritance of, among others, the phenomenologies of Edmund Husserl and Maurice Merleau-Ponty, the *Umweltslehre* of Jacob Von Uexküll as well as Konrad Lorenz' and Niko Tinbergen's ethology (biology of motivation). The semiotic terms make it possible to regard something such as sensation, processes of thought, and intellectual contemplations in an overall integration. Brier does not elaborate on how biological processes could be understood to relate to phenomenological processes in any concrete manner. But he does deliver a theoretical framework that allows one to do so.

As part of the cybersemiotic framework, Brier presents two useful visual models, which, in spite of their unavoidable impreciseness, do enlighten his visions concerning the multiple kinds of cybernetic autopoiesis and semiosis that work in complementary manners as part of the human organism and phenomenological being. In this chapter, I present the second model as figure two, which I also discuss shortly here. I presented the first model, which is the cybersemiotic star, as figure two, in the previous chapter *The Epistemological Turn*.
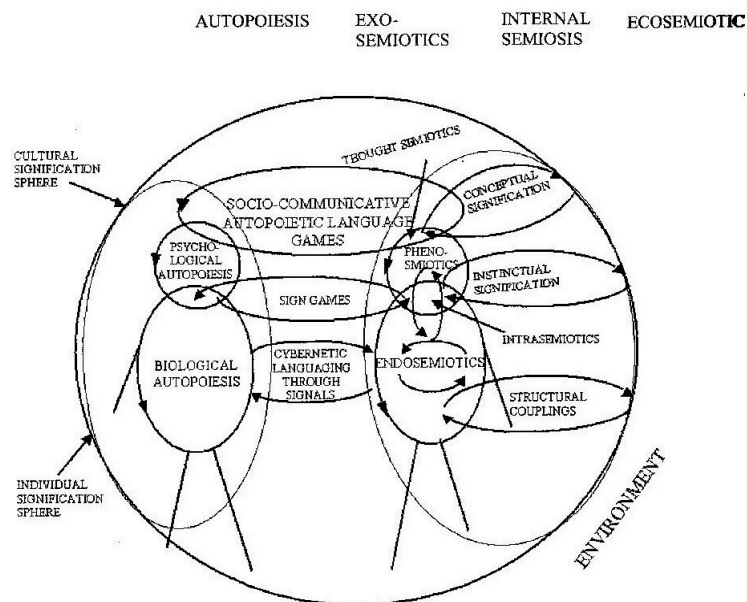
Figure 3: This is Brier's complex model. The cybernetic processes are on the left, and the semiotic processes are on the right. The system of biological autopoiesis contains some of the molecular processes related to the immune system, the nervous system and the hormonal system. Biosemiosis is divided into endosemiotic and exosemiotic processes. It is, according to Brier, interpenetrations between autopoietic systems on the left that leads to the processes of semiosis on the right. It is important to notice that the separate definition of processes and qualities actually forms the ground of an overall integration, where we must see all processes as completely interrelated, co-existing and co-dependent. It is the understanding of the co-dependence of processes, and to be able to grasp these processes within the same overview that gives this model is real potential, in my view.

All though the two models present a high range of complexity when it comes to the way central aspects of the theories they bring together are integrated, at another level they are quite simple. As Brier's model brings together properties of biological semiosis, which could for example be processes of protein synthesis, or chemical reactions evoked by neuron receptors, with phenomenological processes of immediate being based on what we could call pure quality, and intellectualized thought, it is not simple to think of such processes in integration if we are referring to the fragmented language of scientific specialization. However, at the philosophical level it makes sense, and could even be viewed as somewhat banal. Because at a level of common sense, or what we could also call first person experience, it is evident that processes of thought, chemical processes, signalling processes, self-generative processes of the biological organism, cell communication, and something such as sensation, feeling and intellectual thought are symbiotically connected. Otherwise we would not function as wholes. Thus, it has rather been for intellectual and institutional purposes that these areas were divided, and that vocabularies were built up around such divisions. Thus, the simple truth that all processes of the human mind are tied to bodily processes and the reverse has become buried in the accumulation of terms, based on specialized fragmentation. And today, at the philosophical and conceptual level, it is time to present frameworks that can integrate, rather than separate. Otherwise we will end up loosing touch with our own humanity.

The importance of connecting frameworks and delivering terms which can bring together aspects from the natural-, the social-, the life- and the human sciences, is not

only that such processes can be conceptualized together in an overall view. It is also that these conceptualizations connect directly to institutional developments of knowledge, and will thus affect future strategies. Thus, the importance of Brier's concepts lies also in the way they connote meaning at deeper levels, which again relates directly to epistemological backgrounds at the institutional level. If few concepts bring together many frameworks in a useful manner, we no longer need to refer to five different books, while using the frameworks. We can use only one concept, and be in relative agreement of what this concept connotes. The integrative method that Brier uses shows one way of using what still seems scientifically and philosophically fruitful, however cybersemiotics condenses essences into an overall framework on behalf of the most central meaning that lies within each paradigm. And here, I can point to an aspect of the cybersemiotic theory, which is similar to my understanding of technoetic arts: they integrate condensed references to the most important and influential issues, characteristic of the present situation. So the validity and reliability of the theory lays both in the chosen components, as well as in the perspectives that the theory opens up for by presenting meaning at new levels.

6.3. Area and subject matter of the cybersemiotic theory

Further than building upon an overall mechanistic world view, and instrumental principles, the disciplines of information science, computer science, second order cybernetics, and the cognitive sciences at large, have provoked a range of questions that have been difficult to answer within the respective research paradigms themselves. As fields such as robotics, weak and strong Artificial Intelligence and Human Computer Interaction design have become more and more dominant in research, they have evoked

a growing need to define human and machine in relation to one another. In particular, questions relating to our self-understandings as human beings that do not seem answerable by applying metaphors derived from computers and mechanistic paradigms become of increased interest. Such questions are typically concerned with how we understand human sensation, cognition, communication, understanding, meaning making, and in the end: human consciousness.

Many contemporary approaches to cognition and communication are based upon the overall functional and mechanistic information-processing paradigm, according to Brier. Cybersemiotics is thus particular in its insistence on emphasizing the question of meaning and the importance of first person perspective. Brier (2008) expresses his purpose like this:

> 'A basic inquiry of this book is whether the functionalist and cybernetic research program of information and cognitive sciences must be viewed as complementary to a phenomeno- logical-hermeneutic-semiotic line of theorizing on signification and meaning that ignores ontological questions outside culture, or whether these might be united into one paradigmatic framework through a revision of the ontological and epistemological foundation of both classical and modern science, as Peirce attempts.'
>
> (p. 37)

But how does Brier approach the formation of the meta-scientific syntax? What are the basic pillars of the theory?

6.4. Information

To begin with, he draws a historical background for the information-processing paradigm, which has influenced fields related to computer and information technologies, and cognitive science. And in the context of this thesis, it makes sense to mention that these paradigms have, by large, also inspired technology assisted arts and technoetic arts. Ascott himself has been inspired by cybernetics throughout his career as an artist.

Brier starts by explaining Shannon's early definition of information. Shannon's work was mainly based on instrumental perspectives designed to gain functionality in the computer. He defined information as a quantitative property that objectively existed in the world. Information could be statistically calculated, and Shannon was not preoccupied with the question of meaning. Shannon saw information as entropy, and he defined the process of communication as a transfer of information. In this perspective, information could, in principle, travel from system to system without being changed on the way. The system that received information by the transfer process was not understood to alter the quality of the so-called information as a transfer happened.

Further from here, the Wienerian approach began to understand information as negentropy. Negentropy is negative entropy occurring in a complex

environment. The concept of entropy was transported into information theory from physics and engineering, and relates to the industrial period where the development of the steam engine played a huge role. Negentropy was, apart from it's role in physical science and engineering, then used as a metaphor that could clarify the meaning of the concept of information. In light of entropy and negentropy as metaphors, information came to connote a kind of order or pattern that arises in otherwise chaotic or non-ordered systems. This is where Prigogine and Stenger's suggestion of dissipative structures, based on non-equilibrium thermodynamics, becomes influential as well. However, dissipative structures cannot form endlessly within the same context. So entropy, in the end, leads to decay, which we know from all physical relations, both those of artefacts and of organic nature. Information at this stage was still understood as something that exists objectively in nature. It could be transferred as pattern and structure from nature to the respective system in processes of communication. This understanding of information has, according to Brier, had an immense impact on the establishment of cognitive science. Cognitive science, as a field, has integrated the idea of information as something objectively existing, functioning in both animals, human, nature and machine cognition and communication in ways that resemble the algorithmic software processes of computers.

As we move into the second order cybernetics of Heinz Von Foerster, the observer starts to be taken into account as part of the system. Information, communication and systems theory must now be viewed from another level of abstraction. As in the Heisenberg relation in physics, the notion of the fact that the observer plays an active

part in observation becomes an explicit insight. From this, it also follows that the idea of a purely objective position in science must be questioned, because the observer always affects the observed.

6. 5. Autopoiesis

Autopoiesis theory furthers this perspective, and is a central element in Brier's approach to second order cybernetics. The term *autopoiesis* was originally coined by biologist Humberto Maturana, who presented a theory of biological autopoiesis together with his student, Francisco Varela (Maturana & Varela,1987). A central outcome of Maturana and Varela's theory is that cognition is understood as biologically embedded, and overall embodied. The autopoietic system is a system that is organizationally closed, but open to a flux of matter and energy. It is self-generating and self-maintaining.

With autopoiesis theory, the idea of information transfer becomes more complex. Autopoiesis theory is first and foremost a theory of the organism, whereas Shannon's original theory of information relied on experiences with the computer. As autopoiesis theory is applied, there is no longer a transfer that allows for information to travel undisturbed through different systems. Information is, with Gregory Bateson (1972), seen as *a difference that makes a difference*. It comes to be understood more like an *irritation* in the system caused by perturbations, which result in alterations or difference, which affects the internal balance of the system. Autopoiesis theory further couples biological processes with an understanding of cognition, which places it as co-dependent on the structural couplings that a species makes during evolution with its

fellow species members, and with elements in its particular ecological environment. Later, the concept of autopoiesis was generalized from biology into the social systems theory of Niklas Luhmann (1984). Here it was used to describe the functionality and mechanisms of social communications. The social perspective leads Brier to the use of Luhmann's idea of triad autopoiesis, which involves the division, and reintegration, of psychological, social and biological systems. The triad autopoietic systems are, however, no more separated, than the fact that they constantly interpenetrate each other, and thus are mutually co-dependent. They are each a prerequisite for the other systems and their internal processes. It is only at the level of organization and self-maintenance that they are closed to each other. The complexity and self-organizing properties of each system involved must be taken actively into account when we think of processes of communication in living systems.

Already as Brier goes through the systems theory of Luhmann, we are moving towards an extended understanding of the human subject, because he does not exclusively subscribe to Luhmann's paradigm. He distances himself from Luhmann's anti-subjectivism and overall functionalist viewpoints, and insists on a human subject with thinking, feeling and experiential capacities that forms an active part of the process. Brier does this by using C.S. Peirce's triad semiotic philosophy as a major part of the grounding of a new paradigmatic framework. What is central then, is that Luhmann's idea of triad autopoiesis is transported into the cybersemiotic theory as a partial view on something that is by nature understood to be much more extensive. In this redefinition,

it becomes one of the pillars bearing the overall paradigmatic syntax that Brier is trying to establish.

The heritage of cybernetics, information and autopoiesis theory is kept as part of the cybersemiotic paradigm as well. But none of the paradigms do, as we shall see, become overall decisive, and are integrated with the deep ontology of Charles Sanders Peirce, and an overall semiotic approach. Both Maturana, Varela and Luhmann operate with an evolutionary paradigm, and because Maturana and Varela couple their theory of the organism with ideas of cognition, they are moving towards a human science perspective, however, explained from a natural science stance. The inherent evolutionary paradigm within the two frameworks is central in cybersemiotics, as well as in this thesis.

6.6. Evolution

As most readers are aware, the evolutionary paradigm has its strongest roots in biology and the natural sciences. In particular with the impact of the Darwinian paradigm, genetics, and non-equilibrium thermodynamics, the latter of which has functioned as an integrative paradigm between physics and biology. But it has not had an equal place within the human and social sciences, according to Brier. With biosemiotics and the use of Peirce's philosophy, Brier manages to insert an evolutionary paradigm into the humanistic and social perspectives. But it is important to mention that Peirce operates with three kinds of evolution, of which the Darwinian paradigm would belong to only one. Further than Darwinian evolution, which fits with Peirce's concept *tychasm*, he

operates with *anacastic* (evolution by mechanical necessity, which fits with the biological theory of Lamarck) and *agapastic* evolution (which is evolutionary love). I will return to these Peircean concepts as I carry out my readings of artworks in the case studies of Part II, the concept of agapastic evolution being particularly important.

Brier further integrates elements from the biological field of Ethology that can account for instinct and motivation on a basic, biological level. It is within this background that he establishes his term, *sign games*. From there he moves on to biosemiotics, the latter of which also builds on an evolutionary and process oriented paradigm. This is where he makes a clear separation between the cybernetic and semiotic processes, and explains them according to three different kinds of causation, an ontological distinction that originally stems from Aristotle. It is the distinction into efficient cause, formal cause and final cause. Peirce operates with these three kinds of causation in his original rethinking of Aristotle as part of his evolutionary, semiotic doctrine. Jesper Hoffmeyer (2008) integrates this distinction in his version of biosemiotics, because the idea of *final cause* has explanatory potential in relation to the process philosophy of Peirce, which is actually a study of relations. The process oriented, relational perspective does transgress the Darwinian and neo-Darwinian paradigms that have been dominating in genetics and molecular biology, where the idea that biological processes are random, that only the fittest survive, where evolution is driven mainly by competition, and where natural selection based on these principles are main ingredients. In mainstream biology, however, there is no explicit formulation of goal direction, all though central terms used imply a kind of goal direction. This is a paradox that led Hoffmeyer (2008) to formulate

a theory that could explain more of the biological processes than he thought existing theory could do. He calls mainstream biology "immature biosemiotics" (Hoffmeyer, 2009).

Peircean biosemiotics, thus, rests centrally upon the admittance of a level of final causation in nature, in which processes seek towards their own, inbuilt goals, so to speak. However, *purpose* as we know it from human intentional acts, must, according to Peirce, be understood as a species specific sub-category of the much more encompassing final cause. Brier further elaborates on the connection between Aristotelian causation and the threshold between cybernetic, informative and semiotic processes. And this is a point where it becomes clearer that a necessary distinction between *information, sign* and *meaning* must be made. This is because information, understood as *signal* and/or *pattern fitting* (Brier, 2008, p. 365), can be seen as an expression of formal cause, but not of final cause (even if it would be an implicit part of final cause). Information is an alteration within the organization of a system. It, thus, is not based on triad semiosis, and does not rely on an interpretant, according to Brier. What really communicates, then, is not information, but interpretants. And this is a central point of the cybersemiotic theory, which I wish to carry further into the project. Language games come into the picture in relation to final cause, which also involves triad semiosis. This is where meaning becomes relevant for the analysis.

The integration of Peircean philosophy at the deeper ontological level is very important to take into consideration if one wants to grasp the cybersemiotic theory. It must be seen as an accomplishment of Brier to be able to demonstrate and interpret the possible correlations between Aristotelian causation, Peircean evolutionary theory, and the most central aspects of current, academic theory of something as essential as information, communication and meaning, which can relate to both the computational machine, and the human being as part of the Information Society! In placing cybernetic processes within the same paradigm as semiotics, Brier actually does not dismiss the question of human versus machine: he rather complicates its possible answers!

6.7. The extended human subject

To create a further generalization of social communications, and to implement a human subject, that can be seen as an active participator and generator in and of social communications, Brier integrates the philosophy of Ludwig Von Wittgenstein's language games with biosemiotic and ethological *sign games*. This is to suggest, that there is a game with a certain level of self-generality that, integrated with the pragmatics of life forms, also rules the use of language by social players. The language game philosophy does not imply language games as relying on mechanisms that are loosened from its subjects. It rests upon regularities inherent in linguistic exchange between embodied humans who create patterns of action through language. Brier further moves on to pick elements from George Lakoff and Mark Johnson's embodied cognitive semantics (Lakoff & Johnson 1999; Lakoff, 1987). Cognitive semantics presents an approach that can account for the importance of the full flesh and blood body when it comes to metaphor generation or conceptual thinking as part of a cognitively based

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process. This extends the view of Maturana and Varela's understanding of cognition as a biological property, to encompass language, image schemes and so-called ICM (Idealized Cognitive Models) also. The centrality of embodiment is another pillar in Briers paradigmatic syntax.

It is important to notice, however, that Brier distances himself from the strong element of constructivism, which is also an element in Lakoff and Johnson's theory. The point of social constructivism is where the Peircean triad of firstness, secondness and thirdness, and the overall relational paradigm of his doctrine of signs allows for an understanding that places value in the objective existence of phenomena in themselves, and thus extends social constructivism. Radical constructivism, as I view it, operates on a non-explicit philosophy that builds upon a dyad relation, where humans create the world through their conceptualizations, and where there is nothing else in the world than human perception and conceptualization.

To illustrate the connection points between elements that could otherwise seem too complex for integration, Brier created the visual model of human signification, communication and meaning generation (Figure two, page two). On the one hand, we can see how it integrates the cybernetic processes suggested by Luhmann, which rest upon psychic, social and biological autopoiesis. This, then, presents three different kinds of autopoiesis and mediumship. And on the other, he integrates the different kinds of semiosis that, according to him, emerge from interpenetrations between the different

autopoietic systems. Thus, according to Brier, semiosis arises on the basis of cybernetic autopoiesis. It is directly connected to autopoiesis, however, by nature qualitatively different. The intention is to conceptually and intellectually separate cybernetic and semiotic processes as they are expected to have different qualities, however, to simultaneously be closely interdependent and symbiotically related. It is a chosen distinction.

It is the process of semiosis that is based on and demands the element of meaning. And this happens mostly at the level of abstraction and complexity only possible for the human species at a later stage of evolution, where language is developing. So as well as presenting a (simplified) two dimensional model of different processes that lead to communicational exchange and meaning making in and between individuals, there is also an inbuilt evolutionary paradigm, that builds on the capacities of the species to structurally couple intersubjectively, together with ecological environments through irreversible time, and to build up still more complex language games.

6.8 Useful terms in Cybersemiotics

As I relate this theoretical landscape to my own project, technoetic art communications can be viewed as a central part of the externalized signification sphere, where sign patterns are exchanged, negotiated and begin to form and colour communications in social systems. They are viewed both as signs of and as generative forces that lead to new levels of signification, which affect and are affected back again by processes of human cognition, communication and meaning making. As one seeks to theoretically

define such a landscape, new terms with more encompassing potential become necessary, and here Brier's semiotic terms become of use. The most basic semiotic terms, derived from Brier's framework, are: *endosemiosis* (from the biosemiotic paradigm, inspired by Thomas Sebeok. It refers to inner, biological processes from the molecular level and up), *exosemiosis* (refers to signs and signals from external influences), *phenosemiosis* (particularly related to the embodied phenomenology of Maurice Merleau-Ponty. It means pure phenomenological experience), *thought semiosis* (internal, first person processes of thought, conscious as well as sub-conscious), *intra-semiosis* (where all internal semiosic processes intersect), and the mutual relationship of individual semiotic processes with *socio-communicative, autopoietic language games* at the intersubjective level. A very central part of this model is, in relation to the way it becomes useful to the thesis, is the way it makes both inner (noetic) and outer (noemic) processes of communication explicit and more complex. And with this new vocabulary, we can begin to leave the use of Kant's terms *noetic* and *noemic*, and gradually replace them with the terms from cybersemiotics. When it comes to understanding the dynamics of introspection and exchange with external environments from the outside and in, it is central to have the terminological tools to describe internal processes. It is a main thesis of this project that knowledge, at the level of the individual, is formed as a dynamic between internal and external processes of communication, and that, besides from the avoidance of metaphysical and ontological questions, academia at large has not given space to investigations of internal processes, and the way they contribute to knowledge generation. So, since our perspective does not follow the footprints of something such as transhumanism, and since our human subject is, first and foremost a figure that is directly related to nature, the changes that are understood to follow when new

technologies are implemented in modern worlds, do not rely on technologies to augment human cognitive functions, the mental and consciousness at large. There is, of course, a mutual effect between information technology and human cognition. But in this thesis, I take primacy in the relationship between human and Nature. So, with Brier's model, we can suggest an evolutionary extension of the idiosyncratic levels, by referring to the complex model on page two. This stance will be elaborated on further, as I precede in Part II with my case studies. Here, it suffices to say that this project places a particular focus upon internal processes, and how knowledge can, in part, be formed at levels of complex idiosyncrasy, and simultaneously have value to knowledge communities. This is the point where idiosyncratic knowledge steps out of subjectivity, or, rather, presents the knowledge of a post-objective subject. This means that there would be levels of idiosyncrasy, based on internal semiosis, which it makes sense to understand in generalized forms, in forms that we could expect would be common to a large set of individuals, and not just the research subject in question; which, however, are not best described by traditional objective points of departure.

Besides from the fact that model two presents original semiotic terms, it allows for processes, which were formerly thought of as separated, to be conceptualized and observed in their relative relations. We can now see them as processes that are somewhat autonomous, however, never out of touch with each other: constantly pulsating, exchanging and sensitively moving each other in mutual recursive loops; whereas we have been used to thinking of them as separated, static, and non-related.

Brier himself does not take us into the detailed properties of each process, but the idea of placing the cybernetic properties on the right, and the semiotic properties on the left illustrates the important point by which Brier wants to emphasize the difference in quality between the processes, and the complexities involved in human communication and meaning making as the two kinds of processes are combined. This also involves the suggestion, that semiotic properties might not be describable from a structuralist, mechanistic or functionalist perspective alone, which further enlightens the debate concerning machine versus human intelligence. Phenomenological processes, language games, thought processes and overall meaning making might show radically different properties than those of the autopoietic-cybernetic process. And those are not processes that we have been able to imitate in computational machines as of yet.

When demonstrating the theory by model two, Brier places an overview that allows us to think that there could be a way to conceptualize that does not leave mechanics, functionality and pure information out, but integrates this understanding into a larger scheme that also and simultaneously deals with signification, meaning, and in the end: consciousness. It is, however, also when we reach into the topic of consciousness, which is central to the subjectivity theory of this project, that I must distinguish myself from Brier's theory. This, however, will be made more explicit in the practical part, where the case studies per se lead me into explanations that cannot be encompassed by Brier's cybersemiotic model, and must, to some extend transgress it, and question central elements in it.

6.9. The post-objective observer

Personally, besides from the original concept of uniting cybernetics and autopoiesis theory with Peircean deep semiotics, I find the next most potent problem presented in the cybersemiotic theory to be the question of the threshold between information, signification and meaning on the one hand, and the question of how to possibly define consciousness on the other. Brier's work constantly moves in directions of unanswered questions concerning human consciousness. However, these questions are not articulated and treated as a problem in any explicit way.

In the present thesis, the question of consciousness is essential. And it is this exact focus that leads to the necessity of new definitions of human subjectivity. The question of consciousness and subjectivity is a bomb under the assumptions leading so-called objective scientific research today. The aim of the project, however, is *not* to dismiss objective research forms, or to discourage the necessity of empirical research (which is viewed as a way of testing theories against materiality). In the course of the research process, I have come to realize that rather than dismissing the ways of current science and philosophy, what I am out for is to detect and characterise the contours of a post-objective human subject, which can travel across the four epistemological pathways from the middle of Brier's cybersemiotic star with such ease that this endeavour can, in time, be implemented in ordinary learning processes in different kinds of educational institutions. The post-objective subject would imply the capacity to navigate through different mental positions, and thus oscillate between subject-object, and subject-subject positions at multiple levels. The first pathway towards this is to make clear that

induction, deduction and abduction are cognitively founded intellectual abilities that humans have, and not only scientific method. And to be able to make use of these cognitive properties more freely, while, simultaneously, relating to academic epistemologies and methodologies. In this sense, at least from the cognitive property of abduction, which, according to Peirce is based on a creative, imaginative form of logic, where hypotheses or assumptions are made on behalf of already existing insights at a subjective level of the individual, the different cognitive positions can become complementary, rather than oppositional. And, as we will try in this project, we can move into perhaps more cognitive points of departure when it comes to research and the process of human knowing. An objective, inductive approach could thus be supplemented by a subjective, abductive approach. Furthermore, we are aimed to articulate positions of the human subject that is behind objective observation. In the end, there can be no objectivity without a subject that forms its very background. This is the first notion of the human subject, towards which we are moving in this project. And, as I just indicated, the ability to navigate cognitive positions in combination with methodologies rests upon the way the researcher uses his mental energy and cognitive capacity in the actual research process.

So, even if Brier's aim is not as such to research the question of human consciousness, the question of meaning, and the in depth philosophical speculation of how humans learn and know, simply demands renewed propositions and negotiations concerning definitions of human consciousness in academic communities. And the much deeper approach by semiotics, suggested by Brier and the biosemiotic paradigm at large, seems a good opportunity for philosophical speculation concerning this topic.

I will explain more of the elements of the cybersemiotic theory in direct relation to the case studies of part II of the thesis. The cybersemiotic theory functions as a central component in forming my ideal user, which will take its starting point in the model presented in this thesis chapter. Thus, we need to keep in mind the two kinds of processes, based on cybernetic autopoiesis and semiosis. And we need to further keep in mind the new semiotic vocabulary, which will be transferred into part II, and used actively in readings of artworks, and the formation of the ideal user.

Conclusion, Part I

The main conclusions that we can bring with us from Part I into parts II and III concern the definition of the context of the project as philosophy of knowing, and a meta-narrative that involves the current epistemes concerning human knowing, however, by taking a semiotic point of view, places the basic ontological position at a pre-scientific level. This, further, characterises our generative philosopher, who forms the first person aspect of this thesis.

Furthermore, in the epistemological turn, we saw how important it is to re-think the role of digital technologies in both social and academic communication, as communication tools and as, what Latour called scientific inscriptions. The integration of computational technologies, based on digital principles, is, at the very moment, part of the way that knowledge is formed. It therefore becomes determinate of our knowledge. It alters processes of knowledge generation, as well as our ways of being cognitive and finding intellectual solutions. Furthermore, knowledge is no longer only intellectual and theoretical: inventing and applying new technologies also produces tacit knowledge.

This is the basis of the epistemological turn. It turns away from a domination of left-brain intellectualism. And it turns away from regarding theory and speculation as primary over practice based research, which has consequences for thesis writing. In this air, together with the formulations of Basarab Nicolescu, concerning the nature of transdisciplinarity and in vivo research, art gains a transformed role. Where, in Nowotny, Scott and Gibbons' Agora, art is regarded as a sub-culture in negotiation with other sub-cultures on equal terms, and where in Luhmann art is a social system among

other social systems, in this thesis technoetic art is placed in a meta-position to the established symbolically generated media of the agora. Art, then, is viewed as a branch of research that does not have as a main aim to test hypotheses empirically, and produce facts. Rather, it can be viewed as research that locates new dynamical objects, leads to the production of new important hypotheses, demonstrating new use of existing materials, and, in a sense, produces new material ontologies. Art, regarded as a social system, does not produce new in depth ontologies that oppose central social ontologies. And in this sense I claim that some technoetic art works could be viewed as emancipatory in their inborn symbolic. Since I expect art to be functional at many levels of reality, I have sought artworks that particularly are understood to produce new ontologies through practice-based research. I have chosen to classify these works by Roy Ascott's concept technoetic art, because the concept indicates a particular focus upon noetic levels of reality, and thereby the research into human consciousness, and because several of the works chosen explore kinds of communication that mainly rest upon processes of internal semiosis. A main focus and interest in this thesis is to gain an overview over the complexity of processes of internal semiosis, and to ask how they add to processes of human knowing. And how they can, possibly be viewed to increase in complexity over evolutionary time. The signification sphere is viewed as an expression of human, evolutionary development. In this sense, the ways of signification are telling of the humans that inhabit the signification spheres.

Part II: Case studies

Chapter 5, Case study 1: On modelling, conceptual thinking, and order in Nature

7.0. Introduction

In the first case study, I will focus upon human modelling and the use of concepts in connection to human cognition and art making. As we recall, we have chosen an approach where epoché is taken into use. This means that we must institute a naïve state in our approach, wherefore we must be careful about the theoretical sources we bring to the fore, and we must let the generative philosopher explicitly form her point of departure without being dominated by the expectancy of an analytical syntax based on use of theory through critical argumentation.

I view the ability to model and to generate concepts as central aspects of how humans know. Model and concept can be viewed as higher-order levels of cultural semiosis, which are expressed at levels external to the human subject through signs in the cultural signification sphere, and at levels internal to the human subject through processes of thought semiosis, relying on the mind's ability to structure. In accordance with much contemporary theory of mind, for instance the cognitive semantics of Lakoff & Fauconnier (Turner & Fauconnier, 2002), the neuroscience of Antonio Damasio, (Damasio, 1999), and the phenomenology of affect in art philosophy by Brian Massumi (Massumi, 2005), it is fair to claim that a large degree of the mind's ability to structure is based on sub-conscious functions. At levels of internal semiosis and brain based cognition, modelling and conceptual thought is, in part, based on the ability to generate "frames". I wish to leave the question of what forms a "frame" open, because it presents

one of the central quests in articulating the theme of modelling, cognition and art. Further than inner cognitive frames, I expect the individual to operate on behalf of Idealized Cognitive Models, which are based on image schemes that relate to experiences in the world. Idealized cognitive models are models with a high degree of referential value, and they are central to cognition. I expect these to be partially stable, and partially open for re-arrangement in the cognitive mind. The ideas of idealized cognitive models and frames are inspired by Lakoff and Johnson, 1999; Turner, 1996; Fauconnier & Turner, 2002; Shore, 1996, and in part by Thomas Sebeok and Marcel Danesi (Sebeok & Danesi, 2000).

Thomas Markussen (2010), a design theorist, has presented a theory that integrates cognitive semantics with theory of interaction design. A main point in Markussen is that, at a level of cultural communication based on digital interfaces, there are continuous blends between a long term cultural memory where cognitive image schemas, originally based on the experience of physical objects (desktop, typewriter, etc.) form a foundation for understanding metaphors/icons that appear on the graphical interface or in the functions of digitally augmented artefacts.

Markussen uses the example of an augmented reality raincoat, which, in the installation *Blur Building*, is used both as an interface, as well as a regular raincoat. This represents a cognitive conceptual cross-categorical blend that is based on functionality and interactivity. What interests me here, is the question of how new conceptualizations arise on the basis of a socio-cultural reality that is increasingly augmented with digital technologies, which places demands on human conceptual

thought to move to a higher order cognitive ordering, in order to balance with the semiotic complexity presented in the signification sphere. N. Katherine Hayles (2012) is convinced that digital technologies alter human cognition radically and permanently. Generally, philosophies of the self (Zahavi, Gallagher, Thompson) are not taking the effect of cultural artefacts upon human cognition seriously into consideration. This is one of the aims of the case studies, however. The general aim of the case studies involves an inquiry into the potential of art communication to, in their multiple levels of signification, reveal aspects and insight from the (collective and individual) sub-conscious and of inner human nature in ways, which transcend the current level of the prototypic day conscious mind.[21] Following this line of thought, there are two aspects of modelling, viewed from a context of artistic practice, which catch my particular interest:

1. The notion that contemporary technology-assisted art delivers a level of compression when it comes to the sign reference distributed, including the semantic structure of the interface, where signs are understood to be based on complex conceptual blends and loaded symbolic meaning that appears at the signifying level of the artwork and in its user appeal (possible cognitive models that users operate by).

2. That an important result of art making can be the presentation of sub-conscious insight, which has existed as tacit knowledge (individually and/or culturally), however, has been left widely unarticulated at the collective level of the signification sphere.

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[21] This request involves the constant oscillation between individual and collective signification sphere, and thus is relating to an imaginary norm concerning mental schemes and the day conscious mind.

Having made my aim and purpose clear, I will begin the first case study with a consideration of Aristotle's basic terms techné and mimetike. I hereby wish to question the function of art in the relation between human and Nature as a part of my urge to reach new ontological standpoints concerning the knowing human subject. First I need to make a preliminary definition of Nature, however: *Nature can be understood as anything, in any material or non-material form, that works dynamically, that is process based, that affects the four dimensional world that we inhabit, and that has not in itself been directed by the conscious will of one or more human beings*. I have chosen to sketch Nature in a way that allows me to ask to what extend a clear intellectual distinction between human cognition, socio-communicative autopoietic language games and Nature can widen our insight into the process of human learning at an evolutionary scale. I will continuously write Nature with a capital N, when I am referring to my own concept of Nature only. All other concepts of nature will not be written with a capital N.

7.1. Reconsidering Aristotle's concepts *techné* and *mimetike*

Aristotle's *Poetics* has been used widely to interpret the role of art, especially when art was becoming an autonomous institution in modern society during the seventeenth and eighteenth centuries. Francis Wolf (2007) interprets the meaning of the concepts *techné* and *mimetike* differently from how they are often used: as descriptions of art and as normative directions for how art should be. Wolf claims that none of the terms originally meant art, as we know it today. In ancient Greece art was not institutionalized and did not exist as a concept. Wolf, then, understands the Aristotelian concept *techné mimetikai* (pulled together he forms a concept, that could in some ways refer to what we today know as art) as a modus operandus that Aristotle has observed and judged to be a

natural activity in man, and not a normative indication of how art should be. It has thus more to do with the nature of man, than with institutionalized demands on art. Techné is the action of handicraft where a human being masters a material or subject, and creates what she or the local culture has in mind or is in need of, for instance a tool, a logical system, a theoretical frame, or an artwork: a systematization of logos[22] thereby resulting in the pleasure of having mimicked nature both in it's processes of creation (transferring ideas into material form), and/or to create specific products that are like products of nature, or that follow laws of nature. By techné and mimetike man both imitates and refines nature (because he also changes it to suit his own needs). With Forbes-Pitt's term, we could say that he begins to form the artefactually real (a category that refers to all human made forms, which play a central role as a part of the signification sphere) through techné. Viewed upon this background, the artefactually real becomes part of an evolutionary paradigm.

What is then the function of mimesis? According to Wolf's interpretation of Aristotle, the function of mimesis is to create pleasure as a natural, healthy state of being human. Imitating processes in nature, and thereby getting to know them, gives a natural feeling of fulfilment. Hereby one could come to think of something light, inspired by mainstream Western connotations of the term pleasure. This could easily have roots in Freud (2000), who connected pleasure to the lusts of the libido. Even Roland Barthes (1975), who wrote about the pleasure of the text, where the idea of pleasure referred to an innate urge to move forwards in the text and the feeling of satisfaction by consuming

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[22] Where logos is to be understood as something far wider than language, as in the original, philosophical meaning of Heraclitus, to whom it stood for order and knowledge as principles of Nature, not mainly of the human intellect.

the text, connected the concept of pleasure analogically to that of sexual pleasure. However, Aristotle thought that in the nature of man, the state that contributed with the highest level of pleasure was the act of learning by contemplation in the process of becoming. Connected to this idea, I will hypothesize that the Natural telos of art becomes an expression of final cause; and the feeling of pleasure (not desire) an innate *sign* of this process. This understanding of learning and pleasure also shines back on the generative philosopher, and forms yet another premise on behalf of which she operates.

7.1.2. What would mimesis be today?

Today, art theorists have left the concept and idea of mimetike in art. From the time of abstract art, one does not expect art to mimic objects in nature. However, whether we can truly talk of mimesis or not is an unsettled question. I find that resistance towards accepting mimesis in art practice today is caused by the subject-object understanding that lies behind the judgment. Contemporary artists might not imitate Nature in accordance with a simple perception-material object relation. But what complicates the idea of something such as abstract, surreal and expressionist art as being based on mimesis is not, in my view, the fact that they do not imitate. It is rather that our concept of Nature and of the human subject needs to change, in order to understand the connection. This is where our five-levelled reality can help. My suggestion would be that rather than ending the process of mimesis, artists take a turn from an outwards to an inwards perspective. Furthermore, I suspect newer developments in art practice to rely on a development of the cognitive and imaginative capacities in humans that further relies on a mutual influence between evolutionary developments in the cultural

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signification spheres and cognitive minds. In order to define objects in Nature that artists could be understood to imitate today, one can ask: are objects that affect human sensation and cognition, however, are intangible, Nature? Are cognitive patterns and neuron networks Nature? Are qualia? Are complex, semi-autonomous processes, based on internal semiosis, Nature? And from here, we can further ask: does the abstract logic of mathematics or computational systems show any isomorphism with structures in Nature, or are they pure, arbitrary constructs?

7.2. The semi-autonomy of internal semiosis and its importance for knowledge generation

The preliminary concept of Nature leaves two essential realms important for investigation:

a) External input from the physical-material world towards the human senses in exosemiotic processes (what we used to call *the objective*)

b) The noetic mind as a semi-autonomous realm of experience (what we used to call *the subjective*).

The semi-autonomy of the noetic mind comes from the autopoietic processes that forms the more mechanical part of cognition, integrating Luhmann's conceptual division between mind/psyche and language, together with the self-constituency of Wittgenstein's language games, all connected in a larger scheme by Brier (2008). Furthermore, Brier's concept of phenosemiosis and thought semiosis extends our view upon the processes of the mind, and allows us to expect a level of extensive autonomy when it comes to processes of thought in the individual. This is the ground material,

brought forward from the cybersemiotic theory, and we are, again, letting it change the ground premises on behalf of which we work, with deep implications for our understanding of the first and third person human subject that we are studying. We are not using cybersemiotics in a strategy of analysis by critical argumentation. We have consciously chosen the theory as the most potent offer that can form a ground pillar in the thought experiment and wide hypothesis that this project aims to present.

One consequence of the semi-autonomy of the noetic realm would be that there are levels of experience that are, to some extend, independent of external input. This indicates that there is an inner realm of knowing and being that must be understood on its own terms. And we want to investigate the relation between this realm, art and Nature. This is somewhat in tune with Immanuel Kant's original suggestions of aesthetic judgment and apriori categories of judgement, however, at our point in history, the basic articulation that we are able to formulate concerning apriori knowledge will necessarily be changed, because we have a different level of conceptualisation at hand. So we must ask: can we argue for the actuality of an inner reality with semi-autonomous properties, which actively affects our cognitive and sensitive minds, and comes into expression at the level of the artefactually real? And how do we research this inner reality?

There are scientific branches that allow an investigation of inner realms in a variety of ways. Neuroscience and cognitive science are fields typically considered when considering issues of consciousness. They do, however, basically belong to the exact sciences, and rely on objectivism, empiricism, measurement, isolation of single phenomena from the whole, methods of falsification, and a reductive approach. They

have typically not been able to account for first person experience in adequate ways. A method that differs from methods used in neuroscience and the cognitive sciences is the study of cultural communications that stand in a particularly expressive and exemplary relation to the signification sphere in which they are embedded, and simultaneously implement semiosic models that are saying of current understandings of perception, cognition, affect and embodiment.

7.2.1. The biobehavioural basis of art

But let us first ask: how can art be understood as an expression of Nature? Rob Harle (2008), an artist from New Zealand, suggests that the ability to create art on the basis of conceptual thinking, use of metaphor and symbolic expression has become genetically hard wired into the species over evolutionary time. In line with the ground hypothesis of this project, which expects evolution of consciousness to have biological equivalences, I also suggest that art making and learning by contemplation through art making would have biological and/or neurological equivalences. I would, however, argue, in line with Brier's suggestion of the complex model of human cognition and meaning making, that theories of gene replication, or biological learning could never tell the full story concerning the evolutionary development of art making as a human trait. These approaches could, however, deliver important bricks in the puzzle; bricks that extend from the computational explanations of neuroscience and the cognitive sciences, and do, at the same time, leave a biological perspective that can be integrated into the holistic framework that we are trying to establish.

When it comes to making sense of viewing art making as a natural trait that has developed evolutionarily, we only need a certain critical mass, persistence in time, and a pragmatic long term effect of this phenomenon, to make the philosophically inductive claim that art making is, in part, a biologically wired inborn human trait. I will thus argue that it does not make sense to think of this claim as being falsified as in the spirit of Karl Popper (1959), by pointing towards those who are not able to use concepts, metaphors and symbols in creative and original ways. A bio-behavioural trait does not need to be equally distributed in all 7 billion single individuals for it to be a consistent trait of the species, just like neurons are but one kind of specified cells out of many, however, are still natural, specialized, and central.

To conclude we can say that, as Wolf suggested, and somewhat in line with Harle, techné mimetike, or art, can be viewed as a human modus operandus; a central evolutionary trait of our species, which leaves significant traces, with a foundation that lies, in part, at the biological level. To conclude, we can say that not only are we semiosic beings, and create signification spheres. A central element in the signification sphere is the creative and forward directed modus operandus of art making.[23]

7.3. Technoetic art communication in accordance with a levelled reality

Now, from defining art making as a central, innate human drive which colours a signification sphere significantly, I will move on to ask how art can reveal more about

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[23] Which could, antropologically speaking, be a legitimate argument if one takes into account that most human cultures make use of the modus operandi of art making, however, of course, in multiple ways.

objects that are by nature intangible. And ask how we are able to capture intangible objects through structural cognition.

In *The Forms of Meaning*, Sebeok and Danesi (2000) wrote that a key aspect of semiotics is modelling. With Peirce, any case of modelling can have a real object, even if the object is intangible. But we cannot detect such objects if we rest in ontologies that nail us to a hermetically material and mechanistic worldview. It is therefore necessary to establish an ontology that allows a study of intangible and dynamic, process based phenomena. But why take an interest in intangible objects? I will answer this question by giving an example concerning social realities.

As we know, many social relations, if we look at them as phenomena in themselves, are intangible by nature. They do not involve one homogenous physical object that can be observed as an object that we can all agree upon. The referential object does exist, nevertheless. The same goes for Shore (2006), who operates with cultural cognitive models, which, for example, could be behavioural patterns (for example holidays), or concepts that are basically constructs of mind (Santa Claus), but which are central in processes of social meaning making and affect the intentional agency of individuals and groups. Social relations must be understood as real; the same goes for mental concepts. Kate Forbes-Pitt partially solved this problem by establishing her levels of reality. I have extended these in order to allow myself to take intangible levels seriously into account. Peircean habits of nature are, in most cases, virtual and intangible, but they create effects that are (sometimes) detectable (by empiricism, by

inductive, deductive and abductive reason, and by intuition). The conclusion is that habits in Nature exist.

7.4. Human learning and final cause

So let us now extend our discourse on semiotic modelling with terms that can broaden the view upon the evolutionary perspective on art as a human modus operandus, and a bio-behavioural trait based on learning. To suit this purpose, I will present a few explanations and terms from the biosemiotic branch of biological science.

Jesper Hoffmeyer (2008), as a biosemiotician, inserts an evolutionarily based perspective on the processes of living organisms that is based on Aristotle's concept of final cause. Hoffmeyer further inserts a concept of learning, which operates all the way down to the molecular level, and is part of what it means to be a living organism. Learning, in the biosemiotic sense, is located as an event at cellular and molecular levels, as well as at properties that are tied to navigation in the ecological niche. In this way of viewing, organisms learn, both in single lives, but also at an evolutionary scale. Estonian biosemiotician, Kalevi Kull (2012), from Tartu University, in his reference to Hoffmeyer's work, connects the idea of learning in organisms to the concept of semiotic scaffolding. Scaffolding is understood to precede the ability of the organism to take habits at both onto- and phylogenetic levels. In this way, scaffolding becomes central in the process whereby organisms generate further habits, which become characteristic of their being and further navigation.

Inspired by the concept of genetic scaffolding and general biological scaffolding, I will transport the term from the biological-philosophical domain to the domain of social realities and present the idea that growth in semiotic complexity is a sign of evolution. The term is not used as a metaphor, but rather as an attempt to rectify a similarity between processes of biological communication and dynamical patterns of intersubjective communication.[24] The growth in semiosic complexity, viewed as scaffolding, would leave clear traces in complex ways of modelling at the scale of single artist or artist groups. This could be based on scaffolding of information and signs through instruments such as computers, information technologies, but in principle it could also be the composition of architectures and cities built on responsive technologies. This viewpoint thus involves processes of refinement at cultural levels as well as at inner, cognitive (and perhaps cellular) levels.

In lies with Peirce's phaneroscopic connection between firstness, secondness and thirdness, his connection between the logic of mind and the logic of the universe (based on Aristotle) and the extensive autonomy of the sub-conscious mind, it would be appropriate to expect that the process of art making is, in part, dominated by cultural- and day conscious rationalities, but that the construction of concepts and the creative processes involved, are in no way arbitrary when it comes to how works relate to habits in Nature. So, at some level, there would be a level of correspondence to take into account. The tricky thing is however, that in this context we are investigating

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[24] Just like Luhmann did while transporting Maturana and Varela's concept of autopoisis into the social domain

correspondence in relation to five levels of reality, whereas positivistic reality related the materially real with logical aspects of the ideally real, first and foremost.

In classical art, emphasis was placed on observing and representing the relationship between a three dimensional physical reality and human visual sensation, without too much emphasis upon processes of internal semiosis or the other senses. The level of representation, or rather, with Brier and Peirce, the level of interpretation and sign value, which would be relevant to formulate and study today, would lie in an understanding of the relationship between human subject and world that takes into account the increased complexity involved in internal semiosis, and the ongoing dynamic oscillations between internal and external input-output relations. This means that the distinction between objectivity and subjectivity becomes highly problematic in philosophy. When Mark Taylor (2001) wrote the book *The Moment of Complexity*, he wrote of complexity as a social phenomenon. I subscribe to the idea of social complexity, however my focus is upon internal semiosis, where the moment of complexity appears as an inner phenomenon: the inner accumulation of semiosic[25] complexity.

Besides from levels of the socially real, the intangible would be located at the level of the virtually real. The ideally real, on the other hand, is the realm by which individuals can become mediators between the virtually real and other reality levels. The relation to

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[25] "Semiosic" is here used as an adverb and not as a theoretical reference, which shall show its assimilation into the theory, and thereby into the thought processes of the generative philosopher

reality levels is a dynamic, symbiotic relation of constant flux. We are now interested in viewing dynamic, relational, process based, intangible, and/or micro scale objects, and to study their schemes of flux in particular spacetimes, and how they evoke multisensory (synesthetic), cognitive and conscious behaviours (signs) within ourselves. This latter observation gives modelling new connotations. Modelling, then, is our ability to structure percepts in cognitive models that become habitual, and which form prerequisites for models at the level of the artefactually real. In order to understand how and why I find technoetic artworks exemplary, when it comes to defining new semiosic complexities at the level of cultural semiosis, I will go through two different works that can illustrate some of my points.

7.5. Christa Sommerer and Laurent Mignonneau's work *Life Writer* (2006)

Life Writer demonstrates an old-style typewriter with properties of a digital computer, which can transform users' alphabetic writings into generative, virtual creatures that live, eat, reproduce and mutate. This happens in the interface, which is, in part, formed by electronic paper, placed like real paper would have been in a classical typewriter. When users type, each type transforms into algorithms within the underlying code structure of the machine, where the information is restructured. The result is multiple small creatures that move around the virtual paper. The creatures inhere both individual and common features. They have a relative life span, according to the fitness that they obtain by nurture, and the heritage line that is possible to uphold by processes of mating and reproduction. If we are to view a work like *Life Writer* as an expression of modelling, the work demonstrates not only a complex way of modelling, but what, with

Sebeok and Danesi, we could call a higher order tertiary modelling structure, and what with Longo we could say was based on bricolage. The work operates at several conceptual levels, and presents themes that diverge in historical time and disciplinary reference.

If we begin by looking at the iconic level, the usability of the typewriter is based on a central conceptual blend: the mix of the typewriter and the computer. Each concept inheres a line of connotations, which can both be taken fairly far. They would be viewed as compressed expressions of two eras in Western culture: the print era, and the era of the computer. The interesting sign then is the sign that allows a simultaneous distinction and pairing of central elements from both eras. The form of the typewriter and its look as an object connotes static signs on a piece of paper: linear structure and paper books.

Life Writer ©2006, Christa Sommerer & Laurent Mignonneau

Figure 4: *Life Writer*.
Taken from:http://www.interface.ufg.ac.at/
christa-laurent/WORKS/IMAGES/
LIFE_WRITER_PICTURES/LifeWriter06.jpg

The fact that the object is actually a computer gives it an additional set of connotations: computational algorithms behind dynamic signs, digital interfaces and data storage. At the paradigmatic level, we find another blend: the concept of Darwinian evolution and "survival of the fittest", where theoretical science is blended with digital design. The creatures' behaviour not only connotes biological evolution, but also a development of the computer that involves genetic and/or evolutionary algorithms (algorithms that have a higher level of contingency when it comes to development). The two blends present us to a new product at the material and concrete level with interesting symbolic potentials. Lakoff, Johnson, Fauconnier and Turner were preoccupied with mental blends. *Life Writer*, however, presents an externalized cognitive blend, and lets us imagine a fast, dynamic and mutually influential relation between mind and matter, between levels of the ideally real and the artefactually real, which is historically unusual.

7.6. New levels of connotation in symbolic reference

When it comes to the typewriter gaining legitimacy as a symbol that can refer to print culture, which is a period in Western culture that started with the Gutenberg Press in the 1500's, this reference needs to be understood as a symbol. The main definition of a Peircean symbol is that it is agreed upon by convention. One symbolic reference in the typewriter could thus be print culture as a historical epoch. The connotations of the typewriter as a socio-cultural artefactual type further brings with it the idea that print culture is based on social sharing, learning, remembering and developing on the basis of the linear print text as a central way of modelling. With *The Literary Mind* by Mark Turner (1999), we understood that linear print text could be viewed as a particular way of cognitively structuring knowledge and insight.

For our symbol, the typewriter, to rest upon convention, there needs to be a certain critical mass, who are well informed of the history of the printing press, and the centrality of print text for the building of Western culture and the overall signification spheres, and who might also be acquainted with the idea that linear text structure affects human cognition. If so, they are prone to make at least some of the connotations made in this chapter. In this project it is an aim to add new connotations to new kinds of symbols, which takes symbolism into new meta-levels (and levels of the intangible). Further than the symbolic value of the typewriter, creatures' behaviours also gain a symbolic value, which, in this case, can be defined as a reference to evolution proper, to evolution as a theoretical concept, to evolution as a computational principle, and to the intersection point between biological and artificial life. The theoretical concept of evolution gains a material and functional existence in *Life Writer*, and this is a central observation.

But the semantics of *Life Writer* is not as simple as to just present us to conceptual blends in a material form. At the symbolic level, the typewriter/computer and Darwinian evolution/algorithmic evolution blend is also provoked by another inherent symbolic connotation, which is how the typewriter *functions*. Function becomes symbolic. The cutting edge between yesterday (print writing and biological evolution) and tomorrow (genetic algorithms and synthetic evolution) becomes part of the semantic interface through functionality.

Functionality presents the point of discrepancy that brings two central communicational forms and ways of structuring knowledge together. In relation to the

symbolic reference based on the combination of genetic algorithms and interface creatures, the overall generative mode of the installation could be understood to symbolize processes of emergence as well. And we could expect a reference both to a computational principle, but also, perhaps, to habits in Nature. The interface and screen, *and* the concept that lies behind, further bears the potential for anticipatory connotations, which lead to contemplations concerning the theme of humans creating life, such as in computational Artificial Life at the level of the digitally virtual, or bioengineering at the level of the artefactually real. And, it is further suggestive of a way of seeing Nature: a possible relation between the habits of Nature and an underlying set of algorithms, a relation which we have not, as of yet, defined.

Another important point when considering the transfer of mental concepts into material form, is that it appears much more obvious that a paradigm such as Darwinian evolution becomes but one concept among others, which has been developed in the fallible road of human knowing. We get a different overview when it becomes an object of use and functionality, and therefore a single sign in itself, rather than a scientific doctrine that we are taught as truth in school. This pattern of transfer from the development of a mental concept to its artefactual representation has affinity with the historical development of geometry, mathematics, formal logic and quantum mechanics when it comes to their applicability in the construction of the electronic and digital computer, and in software design and interface semiotics. The point here is that geometry, mathematics, formal logic and quantum mechanics were first derived as abstract theories, and today they form basic tools for practical application in for instance

software tools (drawing programs), and form a central underlying part of the current signification sphere. Thus, although the chains of cause and effect between mental concepts and their effects at the level of the artefactually real are by no means clear, it seems legitimate to talk of a transfer that happens over time, where insight from the ideally real is transferred into the artefactually real, gains new status, and provokes new insight at the level of the ideally real.

Danish researcher Falk Heinrich (2009) sees the digital art installation as a social, self-referential kind of communication. Like Florian Cramer (2011), Michael Punt (2006) and Christiane Heibach (2000), Heinrich sees digital installations as distributions of imagination. Here, I will call into remembrance our concept of Nature, which could be understood to work through our imagination. Thereby products of our imagination can witness imprints into our structure made by Nature. When it comes to digital installations we now have the aid of executable, computational code, electronic tools, and sensor technologies to express properties of the imagination. Imprints of Nature on the imagination would, as part of the artistic process, appear as cognitively ordered intuitive insight, which is then implemented into the artwork. Cognition would, as viewed in this context, represent a brain-based ability to structure and create patterns from the flux of percepts, qualia and sign input. From here, we are looking for a link between human cognitive structures, and objects in Nature.

7.7. Adam Brown: *Bion* (2006)

Adam Brown's installation *Bion* is an artificial life inspired interactive sculpture. It represents a text that demonstrates principles of swarm intelligence and emergent behaviour based on hundreds of small units and a generative algorithmic system. Whereas *Life Writer* primarily referred to writing systems and sign systems, *Bion* does not use a well-known object to communicate its message.

Bion represents a solid material form that inheres an overall dynamic behaviour and sensitive responsiveness based on electronic, digital and artificial life technologies. The programming principles rely on a system of local-global activity that leaves each unit with its own level of artificial intelligence. Thereby the global level is not dominating single units in any one to one relation. The use of artificial intelligence algorithms in single units allow for a higher degree of open probability, when it comes to how local-global communicational patterns are generated. But what happens when users interact with *Bion*?

Figure 5: *Bion*. By Adam Brown. Taken from:
http://www.cal.msu.edu/files/5213/1039/5329/bion01-sig06.jpg

When people move into proximity of the sculpture, existing patterns of communication are immediately arrested. For a while, they stay quiet. The presence of a user interrupts the sculpture's internal patterns that had emerged when the sculpture was left without external input. Slowly, units start to adapt to the user by picking up information about them through the inbuilt sensors. Then new patterns of communication are woven in a patchwork of blue light and sound, in which user movement and user presence becomes an integrated part, which again allows the sculpture to form global patterns of communication at another level of emergence.

7.8. Installation, concept, symbol and Natural object

When it comes to viewing the installation on behalf of modelling, the idea of distributed imagination becomes clearer. The small, blue, interactive units of the installation are, according to Brown, exemplifying a kind of quantum energy, called *orgones*. The idea of the bion is a concept originally suggested by psychiatrist Wilhelm Reich (1897-1957), who believed bions to be biological units that carry energy at sub-atomic levels. According to Brown, Reich's theory has been overlooked in the field of classical physics and biology. Brown presents his idea by combining the idea of bions with the historically newer concept of swarm intelligence. Bions are then representing clusters of interactive entities that, in combination, uphold an overall generative order, characterizing an on-going development of behavioural patterns. By modelling a relationship between humans and imaginative energetic entities at a material level, and by using the concept of the swarm, which exemplifies a form of collective intelligence as part of the behaviour of the system, Brown has created a work where user and artist

can have a phenomenological and contemplative experience of the idea of orgone energy, an idea that otherwise has its a priori origin in the noetic landscape of the mind, and on paper only. Brown has made the idea accessible to a multi-modal and bodily experience.

It is an interesting point that while an idea like orgone theory, or biological entities which work in a swarm like kind of intelligence or cognition, is being dismissed as naive vitalism within mainstream biology, it proves necessary to integrate functions similar to intelligence in the moment one wants to simulate life like behaviour in even remotely realistic manners. One simply cannot establish behaviour in a sculpture without concepts that move beyond the idea of randomness and pure statistical Shannon and Wiener information, even if such might be involved at the level of computational algorithms within the sculpture proper.

We can, interestingly, relate this speculative consideration to the propositions of Korean Professor of molecular biology, Sungchul Ji. Ji (2012) suggests that an entity called the gnergon is responsible for invigoration and information of molecular cell work. Ji regards Reich's orgone as a sub-category of his own invention, the *gnergon*, which he proposes to consist of a combination of information and energy (etymologically, the word is derived from the Greek words *gnosis* (knowledge) and *ergon* (energy). To Ji, it is the gnergon that drives semiosic processes in the organism. However, energy is not to be reduced to the way in which it is understood in physical science. In this sense, it is

not equal to kinetic energy, heat or work. It lies at the level of Peircean firstness, according to Ji. Semiosic processes at the biological level demand information, however, biological processes cannot be described as informational only, because they, according to Ji, and along with most biosemioticians, demand interpretation. Furthermore, Ji presents a theory where he likens cellular language (cellese) with human language (humanese). Thus, he finds strong parallels between biological and human semiosic processes at a structural and analogical level. This consideration of what it actually takes to create life like behaviour could also be related to Ji's insistence that information must be a property that leads energy in the biological organism, because concepts of energy based on physical science do not explain the actual complexity of functions relying on energy in the biological structure. There is obviously a missing link, and Ji fills this link out with information combined with energy in the gnergon, whereas Hoffmeyer is satisfied by filling it out with cellular molecular semiosis and final cause, and where Peirce, whose writings have inspired Ji's research, would say that pure feeling is a pre-requisite for matter, and an innate property of organic matter. He would, however, most likely not situate knowledge and energy at a level of firstness.

The problem concerning what it takes to create life like behaviours also presents itself in the emerging field of synthetic biology.[26] Synthetic biology is mainly based on a combination of physics and chemistry, combined with theoretical biology, and is carried out as forward directed research in laboratories, assisted by varied creative approaches

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[26] Reference: Conference, Copenhagen University: January 14th, 2011. 9.00 AM - 18.00 PM: *Machine and Organism - on Synthetic Biology*.

based on computer modelling and chemical experiment. In the long run, however, depending on the true goals of synthetic biology, we would have to expect that researchers run into the same problem: emergent properties do not arise from principles of randomness, and they do not create life. The necessity of a telos or of final cause in processes that involve interpretants is the main problem in mainstream biology, attacked by Biosemiotics.

In Biosemiotics, the idea of final cause is not equal to anthropomorphism, because the discipline is aimed to keep as objective as possible in order to attain empirical goals. But even with the acceptance of final cause and interpretation, something such as an adequate theory of mind is lacking in biosemiotics, where many biosemioticians, in order to place themselves within the realm of the exact sciences, must subscribe to a non-minded scientism that does not take Peircean deep ontology seriously into account, in spite of simultaneously subscribing to his semiotic categories, and parts of his ontology.

Bion can thereby be understood as a piece of mind work that rests upon the ability to generate behaviour in a complex system, expressed in the semiosic language of augmented reality. The techné of Adam Brown is philosophy, science, and technological know-how, but at the level of the ideally real, it is his ability to understand properties of complex, adaptive systems, and to use it as a cognitive structure that orders his contemplations and insights. He must be able to form complex structures at the level of the ideally real in order to express it at the level of the artefactually real.

The ability to move from a point of departure in linear cognitive structure (practiced in print culture), to structures of complexity and process-oriented views at large (practiced in the culture of the digital computer), could very likely have brain-based equivalents relating perhaps to new activation of yet unused areas in the pre-frontal lobes, and new levels of physiological structure at the brain level. Thus, the level of objectification and meaning making can be understood so that interpretants connected to intangible objects in Nature that are based on structure, are demonstrated in the particular way of modelling that *Bion* represents. This, again, generates interpretants in users, which might provoke them to generate new cognitive structures at sub-conscious levels that have physiological equivalences. The installation, then, at a philosophical level, concerning Peirce's idea of evolution, also becomes a sign of a process that combines the evolution of human cognition and cultural semiosic scaffolds in a connective learning process, which relies on the ability of humans to imitate objects in Nature by the particularity of cognitive patterning. Thus, there is an imitation going on, however, the link is not mainly based on a connection between the materially- and the artefactually real symbolized by reference to macro scale objects.

As we return to Aristotle and the thesis of learning and scaffolding in cultural semiosis, this imitative process can be viewed as purposeful outside of the human rational day conscious mind in the way that humans are understood to inhere an innate drive in the direction of imitating, and to creatively producing, and growth when it comes to the semiotic ability to connect senses, cognition and Natural objects in still more complex

and productive ways (combined with a growth in activated yet unused potential in the brain).

But in order to not delude ourselves into thinking that there is a simple line of Natural telos, cause and effect, we must emphasize that human and cultural evolution might not have a plot and an end purpose likely of that of a romance, a tragedy, or another simple linear cause and effect relation. I would rather suggest that inherent in human evolution, there could be multiple lines carried by evolutionary purpose (telos) that are connected to fairly stable habits in Nature. None of which, however, would be overall determinate, or represent potentials that can stand alone. These evolutionary lines form a sub-level of Nature. To not work in completely idiosyncratic manners, we could relate this idea to Peircean evolution, which is threefold, and captures both evolution by chance (tychism), evolution by mechanical necessity (anancasm), and evolutionary love (agapism); the latter of which is more constructive and forward directed. If these concepts are related to the concept of habits rather than laws in Nature, the foundation for a multiplicity of evolutionary lines can be laid.

The complexity of the system presented in *Bion* can be thought to be much less complex than actual enfolded orders of nature, however, much more complex than cultural semiosis at an earlier point in history. The degree to which they can apply to external processes of nature is thereby limited, but perhaps more inclusive than linear, causal structure. As I understand it, such a work is imitating nature by creating a model of dynamic relationships that approximates possible enfolded orders concerning cognitive

patterns by which we structure noetic experience, and thereby ways in which we understand relationships between enfolded structure, and it's outfolded realities[27].

7.9. Conclusion

In this chapter we have accepted to view Aristotle's concepts techné and mimetike as a natural way in which we as human beings purposefully, but often unconsciously, enact natural, functional, and perhaps purposeful, learning processes. These learning processes happen in an oscillation between the collective and the individual, and they cross historical time. At the level of the artefactually real, the modus operandus of techné mimetike results in still more complex and/or refined ways of semiotic scaffolding, which have equivalences in a similar refinement at cognitive levels. Techné mimetike is not bound to a specific institution. Its full reality cannot be understood by merely relating it to institutionalized practice, or with Peirce we could say that its object exists by itself, in and out of the institution. The art theoretical idea of mimetic art is then a retrospective conclusion, based on a cultural heritage concerning art making in a very specific historico-cultural period, rather than an observation of the nature of mimesis as a natural, innate, species specific way of acting that has been practiced for thousands of years.

We can hereby conclude that contemplation of technoetic art installations can bring us closer to new, unexplored territories concerning extra-sensory levels of reality, which again concern ways in which structures of non-physical levels influence upon physical

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[27] The concepts of enfolded and outfolded orders are inspired by Bohm, 1980

levels of reality. This happens both because of the creative mimetic aspect of art making, and because of the demonstration of ways in which we structure our understandings at the noetic realm of experience. The discovery of these reality levels involves the imaginative mind, and new ways of understanding the relationship between mind and nature. It can potentially further our understandings of how we as humans are related to nature, and of our potentials for using our specific, ecological position to enhance the world, we inhabit, in accordance with our minds. By externalizing developments within our own ways of ordering and structuring experience with the aid of electronic and digital technologies, we can learn more of the unexplored territory of the noetic mind, and it's relation to processes in Nature.

Chapter 6, Case Study 2: The Role of Affect and Feeling in Internal Semiosis and in Art Contemplation

8.0. Introduction

In the previous case study I placed a focus upon cognition as an intellectual and pre-intellectual ability to structure and order knowledge, and asked of the relation between cognition and Nature. On that behalf, I formed a speculation concerning how the evolutionary development of cultural sign systems such as verbal language, mathematics and other symbolic languages, ending up in complex semiotic compositions such as the technoetic artwork, exemplify and provoke further thoughts on the relation between human, cognition and Nature. In the present case study, I change my focus to speculate about the role of affect and feeling in knowledge generation and formation.

The urge to characterise and define the nature of aesthetic experience and its function in knowledge generation is ancient. We have met it in Aristotle, Baumgarten, Kant, and later on in Adorno and Horkheimer, and Jürgen Habermas. They have, however, primarily given philosophical accounts of the phenomenon, and have, except for Kant, focussed upon aesthetic experience as a sensational experience. In this case study, however, I aim to combine an art philosophical approach with a biophysical approach, remembering my goal of asking of biological, neurological and biophysical equivalents of the evolution of consciousness and cognition.

In the air of epochè, I will begin by formulating my immediate account of the aesthetic experience. The aesthetic experience is viewed as a moment that can arise in between user and artwork, which effects a significant and persistent inner change of consciousness in the user, which is often assisted by anticipatory insights (indicating that the aesthetic moment exists outside of regular three to four dimensional spacetime). With results gained in Part II, Chapter 5, we could call the aesthetic moment a significant situation of learning that happens in the relation between human and Nature through the mediation of the artwork, which, again, has a clear reference to objects in Nature. The aesthetic experience is here understood as a pre-linguistic experience that can, however, be intellectually interpreted.

With Brier's terms we can already begin to characterise the pre-linguistic part as phenosemiosic, and the interpretive part as a process where thought semiosis mixes with socio-communicative autopoietic language games at an internal level. However, that only leads us to a vague and overall description. Our quest is to ask for a higher degree of specificity. If we start by shortly consulting Kant's philosophy of aesthetic judgment (Kant, 2005), we can see that Kant emphasises feeling as an essential part of the aesthetic moment. Feeling in the aesthetic moment, to Kant, is non-conceptual. It exemplifies a purpose in Nature in a formal way, and it is universal, and thereby exemplary. In this sense, aesthetic judgment rests upon feeling before it rests upon the intellect. But can we be sure that there is a separation quite so rigid between feeling, cognition and language? Can feeling not be cognitive? And how, anyway, can we define a concept as vague as feeling, when seeking a deeper understanding of the aesthetic

experience? We could start by accepting Peirce's concept of feeling, where feeling is understood as pure quality that exists as firstness in the living organism. This means that feeling can also be connected to the physical substance of the organic body. This vague appearance of feeling in physiological substance, however, is with Brier characterised as qualia and pure potentiality, whereas cognition would rather relate to pattern fitting. But what is qualia? And what is potentiality?

In a time of scientific development where quantum- and nano-scientific approaches to physicality continue to provide new vocabularies and new levels of conceptualization related to micro- and nano scales level of reality, we will ask if there are theories that take these fields into account and that could provide terms or metaphors that can allow a more specified articulation of physiological equivalences of what Kant and Peirce had to articulate in strictly philosophical terms.

In this case study I will seek to generate a theoretical sketch, where the study of the artificial intelligence sculpture, *Autopoiesis*, by Kenneth Rinaldo from a perspective of user interaction, is used to provoke insights that can be assisted by theoretical input (mainly by assisting with concepts and vocabularies), which can, in total, result in an integrative transdisciplinary text, which can express new sides of the aesthetic moment. Besides from reading relevant theory, combined with input from *Autopoiesis*, I must emphasize that I bring my personal phenomenological experience, along with abductions made on behalf of my existing academic background with me as a background for the overall study. This is what allowed me to have a preliminary idea of the moment of aesthetics in the first place, and it is what ensures me as a first

hypothesis, that the aesthetic experience is neither based on cultural semiosis, nor on the brain or cognitive patterns alone. It is rather fully embodied, and it integrates more than one physical kind of semiosis, among which is the feeling of electrified excitation. But how can it make sense to talk of electrification as a feeling with real biological and phenomenological sign reference value?

8.1. Feeling

Let us begin by seeking a basic definition of feeling. Antonio Damasio (1999) is a neuroscientist who insists that feeling has a central role in rational behaviour as opposed to the general understanding at the time. He presents a concept of background emotion, which he claims colours all rational decision. And he presents the idea of a kind of second order level of emotion, which suggests complex compositions based on a variety of simple emotions. Damasio's research presented a break with positivistic logic in neuroscience by claiming that feeling and emotion cannot be overlooked in questions of consciousness and cognition.

In order to clearly mark his area of research, Damasio (1999, p. 27) places a distinction between mind and consciousness, where mind is understood as mindedness in total, and consciousness is based on being aware, of knowing and of being a self. The intellectual distinction made between feeling and knowing is well in accordance with Brier's distinction between phenosemiosis and thought semiosis. My use of the concept of consciousness, however, is not equal to that of Damasio. I find that our primary lack of knowledge lies within the domain of understanding feeling as an innate communicating

property of the physiological and minded body; and not as much in the study of the

subject-object relation and emphasis on the external material three-dimensional world.

But how can we move forward then, in our examination of the nature of feeling?

When it comes to the physiology of feeling, I expect a connection between sensation

and feeling. J. J. Gibson's (1968) has presented an, at the time, original idea of

perceptual systems. Gibson's claim was that perceptual systems emerge at a second

order level to concrete organs of sensation. Perceptual systems are not organs, but

systems, based on structure at the next level of emergence. I would suspect that the kind

of feeling I seek to describe, is, just like perceptions, not based directly on chemical or

electrical properties of certain areas of the brain or other organs. Rather it would have a

more global nature. Furthermore, I expect there to be a qualitative difference between

feeling and cognition, and a relation between feeling and qualia on the one hand, and

between structure and cognition on the other hand.

8.1.2. Experience and mind alteration

But aesthetic experience is not just a feeling in itself. It is a deeper, subjective event that

carries a re-organizational principle. Where this level of re-organization happens,

however, is yet unclear. The same goes for the level of biological signification that is an

outcome of feeling.

The idea of a type of experience that can alter one's basic conscious point of departure is suggested in the hermeneutic philosophy of Hans Georg Gadamer (2004). However, where Gadamer emphasized culture and history, and where his conception of the mind was purely philosophical and related to the individual subjective mind, and not to an embodied mind, we are looking to describe how these alterations can be understood to happen at a physiological level, and to integrate our finding from this level with the other kinds of semiosis that Brier has presented.

I must here emphasize, once again, that the human subject is continuously viewed as a part of an oscillatory, relative, dynamic relation with the general signification sphere, and the social collective realm, which consists of other human subjects, networks, social systems and language games. There can be no one to one distinction between the individual and the general signification sphere. The thesis is that if alterations happen in multiple individuals, it can cause an effect in the signification spheres on equal terms as an alteration can happen in the individual (a lasting effect, or to give a single example by mentioning Luhmann's (1994) theory of art: a mutation in the evolution of the art system. This thesis further indicates that an individual is not necessarily, and at all times, a sub-component of the cognition of the overall system. There would be no simple equation placing the individual below or above the level of the collective in any stable manner. And I do also, like Kant, expect processes of inner alteration happening in the aesthetic moment to have a general, but not necessarily universal, character (if by "universal" we mean that the function would be stable at all times). This means that they can, potentially, happen to any human being, and that their quality of inner signification would have a reference point outside of the single individual.

8.2. *Autopoiesis*

Having cleared an understanding of aesthetic perception and judgement and the concept of feeling, we are now ready to examine our third technoetic installation. *Autopoiesis* by Kenneth Rinaldo. *Autopoiesis* (2000) is already one of the classics of interactive art, and it is mentioned as a canonical work in Christiane Paul's (2003) account of digital art.

I have chosen *Autopoiesis* as a part of a case study because it tests the concept of autopoiesis (self-generation and self-maintenance based on cybernetic feed-back loops, a term coined by Humberto Maturana and his student Francisco Varela) at the level of the artefactually real (demonstrates a physical construction that expresses the idea of autopoiesis), rather than merely presenting this idea at the level of the ideally real (mental ideas distributed in books).

It is my thesis that the interactive, embodied experience of an installation like *Autopoiesis* can successfully add to knowledge and insight that already exists as theoretical autopoiesis theory (Maturana, Varela, Luhmann, Brier), and that a theoretical characterization of what possibly happens in user-installation interaction can add to this experience and affect theory (and the ideally real) back. As we know, the installation as a text form is not based on a kind of semantics that makes use of semiotic precision or exactness for its communicational purpose. Rather, it is based on creative conceptual blends and an overall presentation of ambiguity. I have written that *Autopoiesis* tests a concept. But it does more than that: it presents one or more alternative approaches, which, as contemplations between theory and practice/ phenomenological experience are being made each in their particularity, can make

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paradigmatic structures of the central topic (autopoiesis) become more evident and easier to deconstruct. This experience can potentially provoke new insights.

Autopoiesis consists of fifteen robotic arms that hang down from the ceiling in a hardwired structure. The arms are made of cabernet sauvignon grapevines, which are intertwined and compressed by a steel wire skeleton. Each arm is augmented with infrared sensors that emit light and thereby capture positions of users through registration of heat, and make each robotic sculpture user sensitive. This user sensitivity happens in a process of local input/output response that results in attraction and repulsion behaviours of the sculptural arms. The response to user interaction behaviour causes the arms to generate and develop patterns of sound, based on telephone tones. Two of the arms carry inbuilt lipstick cameras that capture users on video, so as to distribute a sense of observation made on the sculpture's behalf. The film is shown immediately on a wall in the installation space. The exploration on the user's side, then, is to acquaint the behavioural patterns that emerge in the sculpture as users interact with it. A central state controller compares input from local devices and gives impulses to the collective behaviour of the arms. Rinaldo, however, underlines that local input/output behaviour precedes global information handling, and the dominion of local over global is a central principle in the installation.
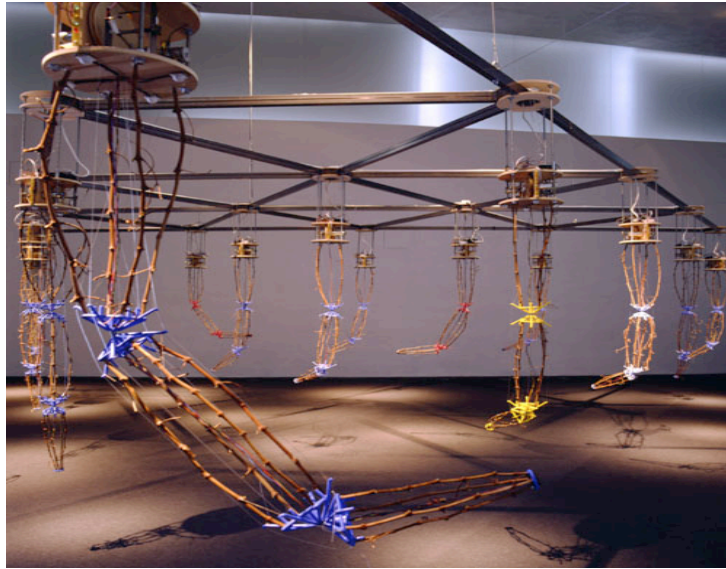
Figure 6: *Autopoiesis* by Kenneth Rinaldo. Taken from:
http://www.ylem.org/artists/krinaldo/works/autopoiesis/atp01.html

The programming of the sculpture is based on artificial intelligence algorithms, which makes communicational exchange between units, and between units and users resemble processes of self-generation and emergence in ways similar to those we saw in Brown's *Bion*. It furthermore adds a theme of evolution to the sculpture, because it develops over time in ways that are, in part, unpredictable. Of course, since *Autopoiesis* is a computational system, the artificial life algorithms do not provide 100% unpredictable reactions. They rather result in probabilistic contingency, when it comes to the communicational acts of individual arms, and the patterns that individual arms create as they interfere with each other's level of contingency at a global basis. The functionality of the installation is based on feedback loops between local and global communication patterns, along with the input given from sensors' reaction to user behaviour. Users do not form the internal system of *Autopoiesis*. They rather "pertubate" its existing internal logic.

On the basis of the autopoiesis like organizational system of the sculpture, Rinaldo has established two overall possible moods in the sculpture, based on the pitch, tone and frequency of telephone tones distributed as an overall soundscape. One emotional state appears as high tones, organized in chaotic patterns. It symbolizes stress and fear. The other appears as calm, harmonic noise, symbolizing equilibrium and satisfaction. The idea is that the sculpture oscillates between the two emotional states, and that they are an implicit part of the user-interaction communication, and of the overall electronic, hard-wired structure of the sculpture. The balance in communication between user behaviour and sculptural behaviour continues to change as users move in and out of the installation. The landscape of tones and motion, then, symbolically, becomes an experiential realm of the sculpture (at a symbolic level), which a user can explore by being aware through a focused and interactive immersed presence.

8. 3. The Ideal User

When seeking to integrate the communication of *Autopoiesis* into my speculative studies, it becomes obvious that it is challenging to study, contemplate and articulate user-installation interactions. How can I for instance expect users to engage in intellectual academic contemplation of artworks? And is there any general scale on which the user can be nailed down and captured?

All though ranges of conceptual images of a user have been theorized, for instance in Human Computer Interaction theory and theory of interaction design, I would claim that there can be no factual, reductive version of a general user. On the other hand, there are

definitely levels of generality in user interaction that can be detected. In art installations, as well as in interface design, the design strategy is typically constructed on a conceptual background (idealised cognitive models) that brings together design skills with academic knowledge. Phenomenology, cognitive science, neuroscience, psychology and/or linguistics are academic areas that influence highly upon design strategies. When it comes to art practice there is, of course, a higher degree of experimentation involved. However, it is my claim that the idealized cognitive models upon which design strategies are made, and which will then form a central part of the user appeal, will appear as an implied user in the interface. The implied user is in no way explicit, but must be analysed forward. The point is, however, that there are clear indications of a specific concept of a user implied in any kind of interaction design, just like Wolfgang Iser (1974) originally pointed out that any literary work inheres an implied reader. And this is one level of generality that we can attach to the ideal user. She will interact with the implied user. The implied user, however, is not identical to the ideal user. The implied user is a level in the installation that gives directions for interaction. The ideal user, on the other hand, is a theoretical and conceptual modelling tool.

Because of the ambiguity of semiotic reference in the interfaces of technoetic artworks, which can neither be read in any unidirectional way, nor through any one cultural sign system, if I want to succeed in articulating the identity of a hermeneutic-semiotic ideal user, I am forced to think of a human subject, who is able to experience new connections between sense and reason, between current disciplinary divides, between

body and brain, and between imagination and reality. There are thus two overall levels of user experience that I wish to examine and implement into the concept of the ideal user: Immediate, phenomenological experience, and intellectual-academic, contemplative experience.

The process of interpreting the experience of the installation from a pure phenomenological and pre-linguistic experience, to an intellectually articulated experience based on meaning making and cognitive models has not been widely explored in theoretical studies of contemporary art. Brian Massumi (2005), as well as Mark B. N. Hansen (2004), who are both philosophers of art and new media, form overall phenomenological approaches that include studies of the body and the multimodal aspect of interface interaction. But they avoid taking the discursive sides of artworks into account. Qvortrup (2003) characterises interactive art as the art of emergence, and claims that intellectual aesthetic judgment is no longer possible, due to the non-referential interface and the non-privileged position of the subjective observer.

As a research subject, who is close, but not equal to the ideal user, I will speculate and treat the situation at an academic, higher-order meta level that, by its very nature, reaches further than that of the ideal user. Had I not a privileged position beyond the moment of immersion and contemplation of the artwork, I would not be able to observe the ideal user and articulate my findings. This gives me already two positions: that of the research subject (which is equal to the generative philosopher), and that of the ideal user. I will ask the reader to note, once again, that I am connecting the act of writing theory to the act of *observation*. Thus, *construction* and *observation* are not opposites.

A semantic construction relates directly to an act of observation, which again relates to one or more dynamical objects. But let us look further into *Autopoiesis*.

8.4. Internal semiosis: symbolized and actualized

So user-installation interaction in *Autopoiesis* involves two sensitive systems with each their level of dynamic, internal communication that integrates function and emotion, and that is central in the communication process; at least in principle. *Autopoiesis* is, of course, a simulation of autopoiesis. The sculpture is, as art theorist Falk Heinrich has pointed out, based on *as-if-autopoiesis* (Heinrich, 2009). It can, however, as it is arranged in a confined space, and demonstrates functional and relational principles understood to be central nodal points in what forms a system of biological-intelligent communication (the inspiration from the autopoietic system), which, furthermore, take their points of departure in central contemporary paradigms, provoke new ideas of the processes of communication involved in inner excitation and feeling, which are possibly happening in the user. By pointing towards computational processes, matter, and emotion, the sculpture directs our attention towards central aspects of bio-phenomenological communication, which are not based on intellectual properties, as we generally understand them, but do, however, demonstrate levels of intelligence at the global level. The level of intelligence that keeps nodal points, functions and communications together, relates to what I understand as organizational structure in relation to full-body, global cognition. The level of feeling would be its unstructured counterpoint. The two would most likely oscillate in a constant dynamic exchange, and their partition would be only intellectual on my side.

If the ideal user chooses to give the experience her full, immersive attention, we could expect it to become an *experience* that potentially *moves* her, involving local and global semiosic processes, and global levels of feeling, which we have still not adequately defined.

Symbolically, we can extract from the overall experience that the sculpture communicates about principles of intelligence viewed as a global phenomenon. The idea that consciousness is an epiphenomenon of the brain, and that emotions stem from brain functions would demand a demonstration of sculptural "sensitivity" based on a system that relies on a local and central processor; not a global system. In *Autopoiesis*, electronics, sound, and mechanical functions are all based on distributed intelligence similar to that of *Bion*.

8.5. The post-phenomenological experience of the user

If we move back to the manner in which post-phenomenological experience mingles with semiotic reading, we have to also contemplate the relation between the semiotic level of the interface, and the post-phenomenological position of the ideal user. Not only does the installation offer the potential for the user to create multiple narrative lines on behalf of the ambiguous semantics it demonstrates, when it comes to symbolic reference to existing knowledge (autopoiesis, homeostasis, equilibrium, emotion, connectivity, responsiveness). But it also offers an embodied intuitive interaction with the semiotic interface that is based on the use of technologies. A part of the signification that leads to meaning generation would thus be technology itself, and the relational

interaction between user and technological functions of the installation. A synthesis of embodied phenomenological interaction with technology based functionality, as well as intellectual interpretations of technologies would be the result. The point being that technology is not without a load of meaning in itself. As has been stated in Part I, chapter two, technological developments represent an epistemological heritage. Technologies demonstrate, in part, what we know, how we have come to know, and how we have come to signify. Part of the meaning loaded in technologies is not theory, but tacit knowledge from engineering processes. These levels have a legitimized signifying value to the post-phenomenological user.

So what kind of meaning construction could the ideal user make? At the intellectual-conceptual level, where we begin to read the signs in the interface, one could contemplate the relation between autopoietic processes based on the hard wired and computational construction (the skeleton and digital-electronic functional structures), the centrality of electronic circuits and electron conduction organized through nodal points and wired structures. One could contemplate the relationship between local and global sound patterns and the information concerning user activity received from proximity sensors distributed in single arms. From here we can ask: is the connectivity presented in the sculpture an outcome of the very particular electronic and digital grammar of a specific artificial text form, and therefore completely text specific? Or do the presented relations between nodes and units that have been necessary in order to demonstrate principles of autopoiesis and emergence, share any reference to relational functionalities and communication patterns in our own biological structures, when they

are exited by feeling in the moment of aesthetics? Are they an instance of Peircean secondness that represents itself in the formation of physiological substance per se?

When we derive meaning on the basis of post-phenomenology, we are taking the concept of technologies as "inscriptions", originally suggested by Bruno Latour, one step further. Latour's (1979) original contribution was to make the institution of academia aware that inscriptions direct and form part of what we had understood as the so-called scientific fact. Later on, in actor-network theory, Latour inscribed technologies as agents in the actor-network on equal terms with human agents. In post-phenomenology technologies are not agents, and they do not appear in line with human agency. They are, however, an implemented part of a general socio-cultural experience. With Ihde, we could say that technologies become assimilated in the lifeworld and in processes of sensation. On the basis of post-phenomenology, we can claim that the integration of technologies comes to lie implicit in the semantic structure of *Autopoiesis* as a text (which represents the level of the artefactually real that is readable as text) as well as in the cognitive and phenosemiosic reception of it.

We have now seen some of the processes that form (symbolic) autopoiesis through electronic and computational power, and interface communication through sound patterns in the sculpture. But what might form the processes of internal semiosis in our ideal user? With Brier and Rinaldo, we can hold on to the idea of autopoiesis with a semiotic outcast as main principles. But since the bio-text is not a robotic sculpture, we

would have to assume that there is much more to the picture, when it comes to the ideal user? Cell biologist, James Oschman (2005), offers a biophysical framework that asks actively of the relation between biology, feeling and consciousness, and brings the topic of bio-electromagnetism into the picture. But how can we move from robotic autopoiesis, and the concept of feeling to biophysics? Is there any relation?

Massumi suggests a connection between the biological body and quantum potential from the realm that he called "the virtual". He suggests an oscillation and communication between the body and the virtual that happened through affects. He thus brought an idea of a non-physical, counter-intuitive physical realm in play as a legitimate level of reality, and connected this reality level to the biological body by addressing the physiological level that produces affects. Massumi's approach is art philosophical. Massumi, however, understood the affective body philosophically and connected "the virtual" directly to central theories of quantum mechanics (physical science).

8.6. Biological equivalents of feeling and affect – holistic biophysics

I find myself inspired to look for answers that relate to Massumi's idea of a virtual space that reaches the organic body through affects. In order to find vocabularies that can help in this quest, I have consulted the frameworks of pharmacologist Candace Pert (1997) and cell biologist James Oschman. Albert László-Barabásí et.al. (2002), as an example of recent inventions in systems biology, present approaches to the idea of global

systems in biology through the network metaphor, however, this approach is not oriented towards understanding the global energy pathways in the body from a more holistic perspective. Because Oschman and Ho both present alternative research that is, however, empirically validated, I wish to test the explanatory potential of their theories in relation to our expectation of a physiological global equivalent of "feeling" related to the aesthetic experience. They are therefore chosen as pillars in my theoretical framework.

Before I move into Oschman's complex framework, I will give a short account of a thesis presented by pharmacologist, Candace Pert. In the book *Molecules of Emotion – why you feel the way you feel* (1997), Pert interestingly suggests that emotions are primarily based on chemistry, and that chemical communication processes based on neuropeptides, exceeded the function of electrical firing between neuron synapses. On behalf of this theory, Pert claims that communication between nerve cells can happen at a distance, and she moves on to suggest a complex communication network in the global body, which is based on the communicational function of a variety of peptides. Thereby, she has paved the way for a theory of emotion that involves the whole body, and that indicates a close relation between emotions and physiological processes, in part, because she points towards a clear bio-chemical connection between the immune system and the molecules of emotions.

One claim that can point towards a global network of communication is that neuropeptides reside not only in the brain, and along the spine, but also at the end of other major organs. From this point of departure, it becomes possible for Pert to not

only claim that emotions are chemical, but also that there is a physiological aspect of something such as memory and consciousness at large. A central thesis in Pert's framework, which was also central in Lakoff, Johnson, Fauconnier, Turner and Nunez, and, as we will see, in Oschman's framework, is that properties of consciousness, even such of rational decisions, are understood to be mainly sub-conscious and tied to bodily functions that do not reach brain interpretations and the intellectual mind in anything other but a strongly reduced version. Pert writes:

'These recent discoveries are important for appreciating how memories are stored not only in the brain, but in a psychosomatic network extending into the body, particularly in the ubiquitous receptors between nerves and bundles of cell bodies called ganglia, which are distributed not just in and near the spinal cord, but all the way out along pathways to internal organs and the very surface of the skin. The decision about what becomes a thought rising to consciousness and what remains an undigested thought pattern buried at a deeper level in the body is mediated by the receptors. I'd say that the fact that memory is encoded or stored at the receptor level means that memory processes are emotion driven and unconscious (but like other receptor-mediated processes, can sometimes be made conscious).' (p. 143)

This research paves a way in which we can find intersection points between biology and philosophy, and takes us one step further in defining feeling, all though, of course, Pert's concept of emotion is not completely equal to our idea of feeling (and definitely

not to Damasio's definition of emotion). Pert, however, focuses mainly on bio-chemistry, and extrapolates into general explanations from this point of departure. The holistic biophysics of Oschman, on the other hand, opens a pathway that allows a complex, but integrated view upon a variety of processes that could be involved in consciousness, as well as in energetic communication in the bodymind. This framework can, perhaps, help us overcome the division between physics, biology and philosophy, between brain and body, and between feeling and emotion.

The biophysical theory of Oschman does not present us to an original speculative proposal like that of Brier's cybersemiotics. The purpose of Oschman's two books (2001; 2005) is rather to present a scientifically based overview, which connects the dots of a larger puzzle concerning the biological organism in order to inform us of energetic pathways and their cooperation with well-known molecular and cellular processes. In this pursuit, Oschman extends the understanding of energy from the concept of "work" derived in physical science, to a broader and more encompassing perspective. His main contribution is to cast attention to the complexities involved in bio-energetic communication. Oschman's concept of energy is, in some instances, closer to the Asian concept of *chi*, which is also to be understood as a real physical dynamical object, and part of his research is aimed towards providing speculative and evidence based theory that can account for something such as the meridians.[28] Oschman's work mainly consists of existing hypotheses, which he combines in a new episteme, aimed towards explaining the biological body as an excitable dynamic and connective

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[28] To Peirce, the dynamical object is the object in itself, whereas the actual object is the way we signify it in cultural semiosis

medium. Oschman moves into aspects of bodily functions that are central in the field of biology (brain-nervous system perception, the circulatory system, the immune system, cell communication, protein synthesis, tissue functions, etc.). But he adds research results and theories by scientists that have been working in the periphery of established paradigms (however, where one of them, Albert Szent-Györgyi, was a Nobel Price winner. Szent-György experimented with theories of bioelectronics and cancer in 1968). The contributions to research that can account for bio-energetic processes and global connectivity in biological tissues have in common that they have not influenced Western biology or medicine to a high degree.

Integrating main aspects of this framework in order to broaden the perspective of the ideal user allows us to articulate biophysical aspects of feeling, emotion and consciousness that are directly tied to the flesh and blood body. Furthermore, it complicates ideas from Human Computer Interaction and Interaction Design Theory, which often present too narrow ideas of human cognition, perception and user experience. Where Markussen (2010) in his use of conceptual blends in interaction design theory broadens the conception of the user by re-evaluating cybernetics and the concept of information in light of cognitive semantics, and thereby points towards biological aspects of perception and cognition, as well as a level of internal semiosis that has to do with cognitive models related to perception and embodiment, Oschman's framework allows us to broaden this view into actual biological functions. Because a high percentage of what we call experience and consciousness happens at an

unconscious level, the next central move is to uncover some of these levels, in order to reach a higher degree of self-understanding.

How well Oschman's theory fits with theories such as cybersemiotics, biosemiotics (based on molecular biology), or Ji's concept of the gnergon as the precondition for semiosis in biological processes, is an issue that needs yet to be determined. For our purpose here, I wish to highlight the most important alternative propositions that Oschman casts light upon in his book from 2003:

-Oschman suggests a view upon the structure of cells, where the cell is understood not just as a solution in a bag, encapsulated by a phosphor-lipid membrane. Oschman suggests that the true barrier between cell and extra-cellular tissues is formed by a layer of proteins, which forms a pathway for electron conduction across cell interior and cell exterior. He further suggest, on behalf of the theory of Buckminster Fuller, and the further work with this theory in the domain of biology by Donald Ingber, that the cell forms an architectural structure consisting of "skeletal" and soft components in a liquid that is more like a gel, and less like water; the architectural structure being sensitive to pressure. This view extends regular ideas of proprioception, and makes the bodymind more sensitive, than what has regularly been thought.

-The central thesis is that extra-cellular connective tissues form a continuum that spreads across the body, and surrounds all cells and harder substances (skeleton, muscles, organs, etc.) in the body; and that so-called integrins form protein-molecules that allow electron and proton conduction belonging to this continuum to be distributed

within cell interiors. Furthermore, water molecules hold the structures of molecules in connective tissues together. This is a property that is abundant in the organism, according to Oschman, and which allows for proteins to function as semi-conductors. The continuum forms a prerequisite for a global communication system, in part based on electron conduction. Oschman calls the entire system of connectivity "the living matrix".

-Because of the architectural structure of cells and molecules, the living matrix gains piezoelectric effects. This means that pressure can cause electricity conduction.

-Oschman explains that it is the crystalline structures of molecular arrays in the connective tissues, together with the arrangement of water molecules, which allows for the conduction of elementary particles such as electrons and protons along whole surfaces and global networks. This theory is similar to the theory presented by geneticist Mae Wan Ho (2005).

-He further presents two kinds of consciousness in the body (understood as awareness), where one is based on the traditional nervous system, and the other on what he calls a "continuum pathway". The continuum pathway is a "super highway" of information that is closely connected to what in Chinese Medicine is called the "meridians". The continuum pathway operates together with the perineural system, and works much faster than the regular nervous system.

-The function of macro level organs (for instance the heart-circulatory system and brain-nervous system) and their close relation to emergent supra-structures based on electron conduction and quantum wave properties brings together micro and macro

levels at certain nodal points, where an interface would be located at the molecular scale.

-Oschman further casts light on the fact that the heart has neurons in an order higher than that of the brain, wherefore the heart might have a function similar to that of the brain (which is also a central thesis in the Institute of Heart Math, California, USA).

It is necessary to highlight that Oschman's theory is, of course, much more complex and detailed than what is possible to bring into this context. Our quest is to let Oschman's theory inform our notion of feeling in relation to aesthetic excitement.

So how can all this be relevant when narrating our ideal user? One element that can bring *Autopoiesis* as a text and our articulation of an ideal user together is Oschman's pedagogical use of concepts from electronics and computer science, when he seeks to describe bioelectronics aspects that form pieces of the puzzle that can describe the complex communication networks involved in the processes of the living organism. I must emphasize that Oschman in no way reduces functions of the organism to explanations made on behalf of electronics, computation- and information theory. He does, however, extract insight and metaphors from these domains in order to support the articulation for instance of the nature of electronic pathways in tissues, and points towards the fact that the technologies that humans develop do, generally, rest upon principles inherent in Nature. Humans, then, extract reduced understandings of

biological processes, and distribute them in artificial text forms, because they are useful. It is in this sense that we can learn from our own technologies.

With Szent-György's thesis that electrons, when the atoms to which they belong form a stable part of a molecular, crystalline structure, no longer belong to one single atom, but rather migrates across the global structure (which is what we could call bio-electronics), Oschman suggests that proteins can work as semi-conductors for these electronic pathways. And Oschman (2003) writes of semi-conductors:

> 'Semiconductors … have the ability to process energy and Information in sophisticated ways, that is, to switch, store, delay, modulate, amplify, filter, detect, or rectify (allow to pass in one direction but not in the other). In addition, semiconductor networks can have read-only and programmable memory and logic circuits that evaluate the information flowing through them. In a living organism, such circuits can make and process decisions that lead to actions. The actions selected are determined by a combination of genetic programming that gives rise to the proteins that are built into the circuitry, the memory of previous activities, and current information from local and distant sources.' (p. 93)

Here we have not only biological equivalences that might relate to the concept of feeling. But the citation also relates somewhat to the processes of our artificial text, since it operates with similar (less complex) functions in order to distribute behaviour, responsiveness and intelligence. Oschman extends from talking solely about electronics

as energy; he also points to the fact that tissues conduct many kinds of energy such as: light, sound, solitons (pressure waves) and conformons. Later on in the book he points towards the pedagogical usefulness of applying the functionalities of a computer network to biological functions, and uses terms such as node, link, protocol, correction algorithms, queue, etc. Oschman (2003) explains:

> 'The terminology used to describe protocols for computer networks can give us some realistic insights into how living systems may be able to communicate and function in a coordinated fashion with little error' (p. 127).

In *Autopoiesis* we have electronic circuits, artificial intelligence, central information handling units, packets of information travelling around the system, light emitting diodes, and, at another level of communication: sound distribution. These functions present a coordinated system of communication, and this system is a central prerequisite for the sculpture's "emotional" states and behaviours. In accordance with the theory of autopoiesis, this system would be a cognitive system that forms the foundation for language, or with Brier: semiosis. However, when taking something such as electronics, light emission and sound distribution concretely, we are asking for another reference, where Oschman seems to offer a more appropriate framework. When indicating equivalences between the biological body and *Autopoiesis*, we must, of course, remember, that we are talking about two fundamentally different text forms. And as we saw in case study one, the main reference would be symbolic rather than concrete. Furthermore, equivalents to biological communication would appear as a totality of relational functionality with a symbolic reference, rather than single functionalities

understood concretely, and transferred directly from one text to the other. Relational structures based on space and time would of course not be equivalent in any concrete manner: micro scale functions in biological tissues that are based on electron conduction would appear in the artificial text as an extrapolated and reduced version that appears at a macro scale level (the artefactually real).

Oschman furthers the points given by metaphors of electronics, computing and information science with a theory of self-assembly in micro-molecular structures, which is far more extensive than the reference points by which terms from computer- and information science can provide for. Oschman's biological communication theory thus involves more than chemistry and more than signalling, which also leaves an open question concerning Brier's use of biosemiotics, together with autopoiesis theory, to describe the variable semiosic systems at stake in the complex model of the human subject (figure 2, Part I, chapter four, p. 93).

A representation of micro scale processes presented in a reduced form at the macro scale of cultural semiosis, such as in Rinaldo's *Autopoiesis*, is, I claim, necessary in order for our intellect to understand. I further claim that the process of understanding increases and involves a higher degree of complexity when embodied interaction is involved. This is so in particular, because, our brains are not able to interpret micro scale processes directly through the intellect at the level of internal semiosis (at least not as far as we know). So, the text forms are not equal. But they can inform each other, and

they can potentially cause a realization that changes the ideal user, if she is willing to orient herself through theoretical contemplation, and if the totality of the experience surmounts into the excitable and mind-altering moment of aesthetics.

Oschman calls the body an excitable medium. This idea fits with my intuitive notion of feeling as being global and electrical. From poetic metaphor we know of being excited and "electrified". Is it time to take this notion from the poetic to the concrete?

Damasio's concept of feeling as something internal could be related to Oschman's biological continuum pathway and living matrix, in which excitation would happen at a regular basis. And, all though this would neither fit with a biosemiotic or a cybersemiotic view, I would see the kind of excitation involved in aesthetic experience to be a sign that creates effects, and which can function as a cause that leads to a network of interpretants at levels of internal semiosis. Oschman suggest properties of global information patterns to be understood as an information system, which exists at an extra-molecular level, and which might possibly connect to what we understand as human consciousness. The brain is connected to this global communication system through nodal points at a local molecular and cellular (neuron based) scale. With Pert we have seen a connection between the brain and the global body through molecular chemistry. When it comes to electromagnetic wave frequencies, we could expect levels of the continuum to meet with single macro level organs in an interface based on wave patterns and wave frequencies (for instance delta waves, which are known in certain brain states as well as in electromagnetic states of the heart). This leaves a potential for many levels of consciousness in the bodymind, one of which would result in the kind of

global feeling that is involved in the moment of aesthetics, the whole of which I imagine would involve an overall, wave based structure that exists shortly in time and space, and that could be understood as cognitive, because it rests upon biological intelligence. It is pre-intellectual. And it is related to, but non-equal to functions of macro level organs (which have a stronger persistence in time and space). Again the pre-intellectual level could be interpreted through the intellect into abstract thought and language (which depends on, but is not equal to, these processes) in internal semiosis, which then accounts for the moment of aesthetics. And we must speculate: it is possible to sense this pre-intellectual excitement clearly outside of brain interpretation through wave-based proprioception alone?

Now, coming from the use of terms such as "information processing", "electronics" and "computation" in regard of the biological body, we could easily come to think that the processes that Oschman cast light upon, would have to be defined as "signals" and "pattern fitting" as according to Brier's cybersemiotic framework. However, as I have tried to demonstrate, I believe that these emergent systems, at an overall, wave based level, would demonstrate a semiotic off cast based on wave patterns that is likely with the connection between autopoietic systems and semiotic off cast in Brier, however, whose basic systems are not as persistent in biological time and space as autopoietic organizational systems.

Yet, in order to truly understand what happens, we cannot rely on a biophysical framework only. This means that our perspective from the natural sciences, as creative as that might be, does not exclude Brier's views, even if it questions and extends them

at some levels. We do need the full spectrum of semiosic processes presented by Brier, to be able to call processes of global electron conduction and wave interference patterns signs, and to speculatively observe how they can cross interface boundaries between the kinds of semiosis involved. If we look at the scientific field of Neuroaesthetics, and explanations of aesthetic experience based on a neuroscientific approach, we can say that such an approach typically produces explanations based on signs internal to one macro system only (brain-nervous system), and not at the multiple levels of emergence in an overall complex system such as presented by holistic biophysics, or the multiple kinds of semiosis as presented in the cybersemiotic theory. It thus represents but a small fraction of what could be expected to happen (local micro level events in a macro level organ, the brain), in the total embodied process of cybersemiotic, multi-levelled meaning making as one gets aesthetically excited.

If we relate this to the former case study, and the idea that there is a higher level of signification in aesthetic excitement, which connects to final cause and Peirce's agapistic evolution, or the learning aspect connected to Aristotle's concept of mimetike, then the philosophical dimensions of these theoretical suggestions grow proportionally. The interpretant or the sign becomes established at a process-oriented basis in a complex dynamical system, where the human subject meets the sign as she connects to instances of agapistic evolution. The signs at the level of the artefactually real are fragments of objects that exist in totality at the level of the virtually real. Given the extra level of reality, which is not usually taken into account by contemporary science or

philosophy, the conceptual equation in the semiotic triadic landscape becomes complicated, however, no less interesting.

8.6.1. Biological transcendence?

To this, I will shortly comment, in accordance with claims made in Part I, and in case study one, chapter five, that the artwork would ideally invoke a semiotic connection between levels of the ideally real and objects of the virtually real, which would represent unknowns or unknown unknowns at the cultural level, and that that meeting is what characterises the true quality of *difference* that is central in the moment of aesthetics. This means that it involves the idiosyncrasies of internal semiosis, but that it also provokes alterations within them. It also means that the intelligence of the bodymind "knows" of the unknown unknown before intellectual mind would ever know. The meeting between the ideally real, the virtually real and extensions of idiosyncratic levels seems somewhat similar with what Kant and Husserl called *transcendence*. However, in the time of Kant and Husserl, it was only possible to describe the level of transcendence in philosophical terms, and it was in no way possible to make empirical evidence of this state of mind. The idea of a connection between the virtual and the physical body, which affects experience significantly, goes well with Massumi's idea of a connection between quantum potential and affects in the body. I thus envision that the moment of aesthetics would function as a prerequisite that allows new virtual objects to be brought into the sphere of cultural semiosis. I do not, however, feel convinced that it would be adequate to equal the virtual with the idea of quantum potential like Massumi does. I expect the virtually real to be more rich, more

qualitatively describable and more ontologically deep than Massumi's idea of the virtual.

8.7. Homeostasis, signification and the agapastic aspect of regular heart beats

Affect and *feelings* are expected to have semiosic function, and to be directly connected to processes of cell communication, and communications at quantum levels. The informative processes of global quantum communication could possibly affect and be affected by the dynamics of overall homeostasis in the global bodymind by networked feedback processes at another systemic level. The idea of h*omeostasis* as a regulating function balancing the interference between different systems of communication in the bodymind is central (Damasio, 2005; Hoffmeyer, 2008; Oschman, 2005; Ho, 2008 have all emphasized the importance of homeostasis in biological and psychological processes in each their different way). As I view it, homeostatic equilibrium becomes an interface that allows transfer of information from phenosemiosic and/ or biophysical levels to such of thought semiosis. And this perspective also seems to connect well to our study of user navigation in *Autopoiesis,* and its semiotic indications. *Autopoiesis* imitates the idea of homeostasis in a system.

The term homeostasis is here extended from its original physiological meaning, which generally concerns stress and relaxation of the peripheral nervous system, into involving a more complex dynamics of larger scale affect and feeling (Damasio, for instance, talks of homeostasis in relation to complex feeling). It could also be likened to a momentary

state of equilibrium, which could occur at certain, non-stable intervals, and as part of the biological processes involved.

And, to complicate matters, we could expect that equilibrium could, in principle, occur at some emergent levels, and that different systems might not achieve equilibrium simultaneously, or at similar time scales. Thus, the semiotic line between what Brier characterises as autopoietic systems, and which I would extend to involve several levels of reality, would mutually cause moments of equilibrium across autopoietic systems (through structural couplings), which would cause moments of balance that could be interpreted at the level of internal semiosis. These moments of semiotic balance gain sign value to the phenomenological and intellectual mind.

From here, we could further the thought with the observation that coherent heartbeats are essential for optimal bodily functions. Ho (2008) writes of electromagnetic signals of the heart as either being in distress, or in balance, where feelings of love are directly related to the balanced state that relies on coherent heartbeats. This, analogically, relates to *Autopoiesis*, where irregular, fast and distressed sound patterns indicate frustration, and where regular harmonies of sound indicate happiness.

The signals from the heart could also be interpreted as signs of something at the macro level of the bodymind (connecting of course to all other emergent levels), which I choose to relate to the evolutionarily based phaneroscopic telos of final cause, involved in aesthetic reason, which again relies on the sense of being moved: First of all, one is sensuously moved. Second of all, this movement leads to aesthetic synthesis at the pre-intellectual level consisting of short-term cognitive structures at the level of

wave consciousness, which connect to macro level organs, the signs of which are coherence in heartbeats and a positive feeling. The signifying events thus happen at different scales of biological time and space, and must have a complex coordination. The series of events would, perhaps, be registered by brain cognition as one, overall event, which can, again, be interpreted into verbal language in the form of retrospective contemplation, where the ambiguity of signs in the interface is connected into a meaningful (semantic) whole that connects to instances of feeling assisted by the aesthetic moment.

If we look at it from a perspective of trying to understand the dynamical object of processes of internal semiosis per se, and the pertubations and semiotic counterpoints, the processes might not be complex in themselves. By this I mean to indicate that biology on its very own premises is capable of running systems that are, by far, superior to our mental capacities. The organism's capacity for arranging complex semiotic exchange, however, might re-present a simple semiotic logic to itself: interpretants are established in a healthy organism with *ease*. At the theoretical level of the research situation, however, we have to draw intellectual distinctions to serve our conceptual understanding of the dynamic continuum of the bodymind. Without analytical division we do not understand the whole of the model, and more importantly: we are not able to connect aspects from the otherwise ambiguous and seemingly incompatible frameworks of evolutionary natural sciences and hermeneutical-semiotic human sciences.

From here, we can make a short conclusion by saying that like Aristotle's idea of learning by contemplation, being moved aesthetically becomes a positive sign that involves the whole spectrum of the biological, psychological and social body; a sign that indicates a state of health, and can be experienced as part of an anticipatory telos, which, however, at higher levels of habit in Nature, is perhaps a simple, overall process, which human beings only experience as partial signs.

Chapter 7, Case Study 3: Instances of consciousness. Contemplating the signs of evolution.

9.0. Introduction

In this case study, I will present a close reading of the bioart installation, *Blue Morph* (2010 version), created by nano scientist James Gimsewski, and artist Victoria Vesna. My close reading will be based on the relationship between the artwork and the concept of the ideal user, which I commenced to develop in case studies one and two. Whereas I have been concerned with modelling and describing the work as a text in case study one, and with defining aesthetic sensibility in case study two, I will be focusing upon a further investigation of what opens up in Ho and Oschman's perspective, concerning the intersection point between biology and consciousness in case study three. With a focus on the oscillation between artwork and ideal user, and in my quest to define new states of subjectivity, I will remain in a focus upon processes based on intrasemiosis, where we find the idiosyncrasies and generalities of individual perception, cognition and consciousness. From here I will explore how the ability to integrate deeper layers of introspection into the process of self-observation, and to actively affect observation processes by means of technoscience, might, in combination, play a crucial role in our present potential to understand more of human consciousness. Case study two was concerned mainly with affect and feeling as prerequisites for the moment of aesthetics, which was understood to be based on interfacings between micro level global systems represented as the sign of *feeling* in internal semiosis. *Blue Morph* can add to our self-understandings in ways that take new levels of science into account, by pointing towards nano-science, not only as a central contemporary scientific pathway, but also as

presenting levels of reality which can be hard to grasp, and to connect with in real life experience, and experiences of the day conscious intellect, and even normal ways of being sensitively attentive. *Blue Morph* connects levels of scientifically based epistemological insight with spiritual ideas concerning Buddhist silence (the idea that the mind can become silent through meditation, which indicates that another level of consciousness has been reached), the affect of meditation on consciousness, and appeals to a contemplation of what no-thing might stand for.

As we commence, we must remember that the ideal user and the research subject differ only in a manner of degree, and that they constantly affect each other mutually, as they represent two close states of noetic subjective observation, connected to me as a researcher.

Figure 7: *Blue Morph* by Victoria Vesna and James Gimsewski
Taken from: https://quote.ucsd.edu/feministit/files/2013/02/VictoriaVesna.jpg

9.1. Blue Morph

Blue Morph communicates as an artwork mainly by an aesthetic and multisemiotic[29] interface that involves a physical exhibition space. It demands an embodied, interactive and immersive approach by the user. In *Blue Morph* nano scale movements evoked by the transformation process of the *Blue Morpho Peleides* from caterpillar to butterfly, is translated into sound. The use of nano scale mirrors and a projected nano scale, laser beam, effectuates this. The laser beam registers the vibrations of the movements of the caterpillar's shell over time, and transforms them into audible sound. When visiting the installation, the user must place herself in a silent sitting position, and wear a caterpillar like hat that hangs down from the top of the ceiling (Aalborg, 2010 version). By wearing the long hat, and retreating into a state of attentive focus upon the *innenwelt* (Uexküll), which demands of her to balance her body in its center, she is presented to the soundscape of biological metamorphosis.

Further than presenting this soundscape, the installation distributes digitally projected images on four pieces of white cloth, also hanging down from the ceiling. Images appear only in moments where the body is physically balanced in its own center. The images are held in bluish colours. The blue colour is significant for the way the Blue Morpho Peleides butterfly is normally registered by humans at the level of the non-aided, gross senses. However, as Vesna points out, what we experience as colour is in

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[29] 12*Multisemiotic* is a term that has been necessary to establish and use as part of New Media Theory, in particular when it comes to literary science and text science related to the many semiotic sign systems of digital text. For further reading see Günther Kress (2003), Christiane Heibach (2003), Søren Pold (2004). I apply the term also to Augmented- and Mixed Reality settings, which means that material objects can also become part of the overall semiotic interface.

this particular species not pigment, but nano scale, optical effects of the patterns inherent in the structure of the butterfly's wing.

The installation is based on a communication that evokes interpenetrations between functions in bodily systems that, according to general beliefs, would not usually meet: the silence of nano scale behaviours, the gross senses, and the cultural signs that we produce on behalf of impressions from such, interpenetrations between biological signals internal to the body, thought semiosis, and socio-communicative autopoietic language games. By technological amplification the signs that we took for granted when observing the butterfly without technological aid (or with Latour's terms without inscriptions) transform from colour and growth to patterned, optical structure, and sound. We are presented to a level of reality that is not available to our naked senses. Furthermore, in *Blue Morph,* as we have seen in *Life Writer*, *Bion* and *Autopoiesis*, object and representamen moves from being static properties, to be representative of processes in action.

In the first place, as one interprets the experience of *Blue Morph*, the immediate impression would be one of having experienced a set of nano scale events translated into macro scale events by the use of technological inscriptions. We do not usually have direct access to nano scale level of semiosis inside ourselves until we signify the experiences in some sort of language, which, in the inner process of the individual, would happen in thought semiosis. I described the process connected to aesthetic

synthesis in case study two in such a way that there would be a conceptual relation between quantum biological processes, phenosemiosis and intellectualized thought semiosis. Thus, I suggested an intersection point between processes that would allow micro scale events to become known to the intellect. It is, however, by no means clear, how this could happen. Or whether all people would be equally sensitive to these subtle, internal signs, and if so: how one would become sensitive to them. In this case study, we are moving further into these questions, and questions of what it means to become acquainted with micro- and nano scale level events as part of our conscious experience. When it comes to the nano scale levels presented to us by *Blue Morph*, we have to ask ourselves: does it matter whether we understand the butterfly as blue and metamorphosing or as optical light patterns and dynamic patterns of sound? Will we make new, metaphorical assumptions, and interpret life in new ways, once we have experienced the butterfly in a context of cultural semiosis that points towards the important role of vibration and optical effects in the living organism? And how can we understand the role of technology as intermediate between nano scale signals and our gross senses?

9.2. Phenomenological and contemplative moments of the ideal user

What is particularly interesting about *Blue Morph* is how the interface is constructed to invoke a focus on first person perspective, and the activity of introspection. So part of the narrative of *Blue Morph* would naturally be concerned with physical levels of introverted states of being. Very few interfaces are constructed towards the user having to pay attention to inwards processes while presented to external (cultural) significations. So *Blue Morph* is original in this way. Besides from the visual and

auditory user appeal of the installation interface, it appeals to the tactile senses through the hat that delivers the sound, and to the proprioceptive senses necessary to keep balanced in one's center. The immediate experience of these levels would all be an implied part of the phenosemiosic process.

At the level of cultural semiosis, where one would take one step back and view the installation intellectually, the objects of the installation come to gain their semiotic quality by symbolic reference to the very being of the caterpillar as it is in the middle of its transformation process. Thus, the real process of a living organism, which stretches in time and space, becomes an object of reference. The situation established in the installation becomes the representamen, and the interpretant is the relation between the two, as understood by the user. Naturally, no process of signification is that simple. There would always be multiple levels and layers, and furthermore, the Peircean semiotic picture is one of networks of interpretants in dynamic, communicational (never ending) processes. Further than looking at the overall process, which becomes a sign, there are also references at the level of the single material object. The reference of the long hat clearly presents a reference to the shell of the Blue Morpho Peleides larvae, which gives it an iconic value. The soundscape and virtual images also have a level of iconic value, however, it would make sense to call both symbolic, partially analogue references to the living and moving nano scale processes which refer to the real-time scenario of the larvae's transformation process, however at a scale of technological amplification and a digitalized time recording, non-equal to the real process of the larvae, yet a clear reference.

The question of what does it feel like to be a Blue Morpho Peleides caterpillar is thus sought symbolically and phenomenologically staged and questioned in a very material sense that demands of the user to completely immerse herself into the experience. All though it could be viewed as a banal comment, I place value in the difference between a kind of communication that integrates the overall bodymind, however, still has an intellectual appeal, and regular print theory, which writes theoretically for instance on the subject of the ontological being of the caterpillar. In reading the theory you have a language based abstract object to refer cognitively to. In an installation you combine a phenomenological experience with the intellectual experience, activating existing and known concepts into a process of meaning making and understanding. When such insights are presented in material, interactive communicational forms rather than intellectualized print speculation, there will be consequences at the level of overall learning, to which I have referred by both Aristotelian and Peircean philosophy. An installation has a higher potential, in my view, to cause induced experience through the sense of being moved, than a print theory: at least if we think of the integration of sensuous modalities. And the user appeal at the intellectual level is associative, rather than directive, which is often the case with linear print communications. It thus appeals to already knowns, which are, however, designed in new synthesis (of meaning making) with indications that go beyond common cognitive schemes. If the artwork is successful in my view, it will demand of the user's subconscious processes to seek new conceptual blends and new knowns, and to combine them in creative meaning making.

9.3. Meditation as phenomenological experience and as a symbol of a state of conscious being

Apart from this, there is yet another level of symbolic reference, which is part of the design of the interface, and not a clear, explicit, fixed sign. This is the level of the interface that suggests to the user to enter a meditative state, in which the focus of concentration is on the relationship between breathing, sound input, and closed eyes. This inbuilt request of the interface to identify with the physical state of meditation is indicated by the sitting position one has to take to experience the installation. And it is part of the pattern of interaction necessary to make the installation react in the expected way: the body that is balanced in its center is what makes the blue images and the sound become available to the senses of the user. If the user slides out of a centered body position, the images refuse to show. This means that it is part of the affordances of the interface, and of what we could call the implied user to enter at least a meditative position, and perhaps also a meditative state. But the state of meditation also symbolically refers to a particular bodily state. This state involves physical alterations of the inner body, which have a philosophical and biological relation to the subject of nano scale processes in relation to intrasemiosis and the question of consciousness, if we recall the section on holistic biophysics in case study two. I will return to this more explicitly in the section on Ho's biophysics. But what does the state of meditation indicate to the contemplative ideal user, if we look at it from a scientific perspective?

It is known from studies of meditation that deep breathing can alter the brain waves, and the overall state of the reticular system, among other things. It has been examined scientifically that the mastered, meditative state would, ideally, evoke a relaxation of the frontal lobes of the brain, and an activation of alpha brain waves in the

posterior brain regions.[30] Thus, the meditative state would affect the autopoietic processes of the nervous system.

This normally results in a less attentive focus on exosemiotic sense impressions, less prejudgment, and more openness to the pure flux of consciousness within (phenosemiosis). As seen from this perspective, there would be a relationship between the different kinds of internal semiosis (bio-, pheno- and thought semiosis), and what we understand as consciousness. This would further have to do with how brain based cognitive properties of the user are activated, in my view. The meditative state seems to allow for consciousness (pure phenosemiosis) to operate more on its own terms, so to speak, than when it is directed by the day conscious focus of attention and will. My thesis is that when entering the meditative position, informative events based on internal semiosis of the user could be experienced more on the terms of phenosemiosis, than if the user was not in a state of meditation. This would be so, because the judgmental functions of the frontal lobes are not directing the interpretation of input and experience in the manner that it would regularly do.

The question of the symbolic value of meditation is, though, whether the user is able to truly enter such a state, while visiting the installation, and thus get an alternated experience of meditation, which is based on the assistance of remedies and technologies. And at another level, where we have understood the interface as a symbol

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[30] Lagopoulos et al. Increased Theta and Alpha EEG Activity During Nondirective Meditation. *The Journal of Alternative and Complementary Medicine*, 2009; 15 (11): 1187 DOI: 10.1089/acm.2009.0113

of the meditative state, one has to ask whether meditative silence *per se* could be understood as a state of pure (thoughtless and non-signified) phenosemiosis as suggested in the above paragraph? And whether nano scale phenosemiosis is empty in day conscious thought connected to language games, however, full at protosign and biosemiotic and quantum semiosic levels?

In *Blue Morph* this question is answered by technological amplification, which indicates fullness at the nano scale. It thus indicates that experiences which we have thought of in purely philosophical terms, for instance through Indian systems of transcendental meditation and the philosophy connected to this practice, are now discovered or signified by empirical research. And if we are able to signify by empirical research, what we could only signify through intellectual thought semiosis with verbal language as a medium before, a change has happened in our common perception and conceptualization, as I see it. The signification sphere is evolving, and this involves the development of not only communication systems, but also of individual and collective cognition and perhaps consciousness. As indicated also in case studies one and two, there has been a transfer of insight from thought to practice over historico-cultural time. This transfer evokes the development of cultures and cultural communications, largely speaking. The only reason why this connection is so invisible is that there has been a division in space and time, as well as a division in our ways of fragmenting knowledge, which has not allowed the two different approaches to come together. And first and foremost, Indian philosophy as one example, has presented philosophical truths which are applicable today (at the level of the artefactually real), but which were, however, not

resonant with the state of the arts of contemporary signification spheres, when it was formed: there was a discrepancy between the virtually real and the artefactually real that prevented the two to meet. Indian philosophy could, to some extend, be applied to the spiritual development of cultures and individuals, however, not to the formation of artefactual materialities in signification spheres.

9.4. Is phenosemiosis full of quantum jazz?

At this point, I wish to shortly move into the biophysical theory of quantum communication by Ho. Ho's perspective is closely connected to the influence of current technoscience, that is, science that is not only related to, but relying on technological developments. In this perspective, specific instruments used must be seen as an implicit part of the process of observation. In relation to the theme of technology in the art that I work with, it makes sense to point out that there are researchers today who no longer make a distinction between technology and science, but use the term technoscience (Ihde, 2009; Reichle, 2009). In relation to nanotechnology it is obvious that new technologies play a central role. Ho (2008) has, due to unconventional use of polarized light microscopy, been able to localize light in the water structures of a Drosophila larva in all the colours of the rainbow. Ho tells of her cooperation with Michael Lawrence in 1992:

> 'We had accomplished the first ever, high resolution and high contrast imaging of an entire, living, moving, organism. And the very idea of using polarizing light microscopy to look at dynamic order within the organism was also new.' (p. 208)

The untraditional use of microscopy resulted in the finding of optical patterns in many light frequencies below such of visible light at nano scale levels. It is important to notice that the larva was whole and alive at the time of measurement (biological in vivo research as opposed to studying parts of dead organisms). The light interference patterns were, to Ho, signs of the structure of molecules in cells and tissues, which she found to be aligned as liquid crystals, with properties that allowed them to move together as a whole. The crystalline alignment of molecules, to Ho, forms the basis of a proton conduction network of communication at the quantum level of the organism. Ho's work forms an element in what has inspired Oschman's theory of energy medicine.

In *The Rainbow and The Worm*, Ho relates the philosophical concepts of time and duration, originally suggested by Henri Bergson, to these recent biophysical findings. To Bergson time is mainly related to mechanical, clockwise time, and duration is more of an inner, conscious and subjective experience. Ho suggests that consciousness in living organisms could be related to the quantum properties of what in this context I choose to call nano scale communication, the interactions of which Ho calls quantum jazz. She describes the complex networked, far from equilibrium, non-linear interferences of the organism with the metaphor of quantum jazz:

> 'compartment, micro-compartments and micro-domains, right down to molecular machines, protons and electrons, each functioning autonomously, doing very different things at their own rates, generating flow patterns and cycles of different spatial extensions, yet all coupled

together, syncopating and harmonizing in complex rhythms, a veritable quantum jazz of life.' (p. 283)

In Buddhist philosophy silence is as important as noise. In the scientific universe of Ho, silence might be equal to quantum jazz. Perhaps Buddhist and Bergsonian philosophy present a level of signification of phenomena that take place in internal semiosis, which is based on a more direct and undisturbed relationship between phenosemiosis and thought semiosis? A level of biological signification that is freed of the dominant influence of logical, cognitive, brain based interpretation, yet possible to experience, nevertheless? And perhaps the quantum jazz of Ho presents a level of signification based on new technologies and empirical testing, which implies a techno-scientific level of socio-cultural language games that does, however, point towards aspects of the very same phenomena?

What, then, is the difference between philosophically based top-down insight, and empirically based bottom-up interpretations? What parts them? And what brings them together? Ho's theory relates well to the symbolic indications of *Blue Morph*. When new technologies allow us to interpret signs that we were not formerly able to interpret, our overall interpretations of reality at the level of cultural language games, and perhaps also phenosemiosis, alter. What does it mean that light and sound occur as part of the communicational processes in extra cellular tissues? What does it mean that properties that we have usually tied solely to processes of our gross senses, like eye vision based

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on eye-brain interpretations of light waves/photons, and hearing based on ear-brain interpretations of sound waves/phonons occur in similar ways as part of semiosic processes at the level of cells and molecules? Are cells and molecules perceptive when they interpret photons and phonons? Can we ask of a semiotic connection? Do they *interpret* light and sound waves, or do they solely react on the basis of properties of signalling or pattern fitting? Or do they function at collective bases in ways that makes the use of the interface metaphors more relevant, as suggested in case study two?

To Ho, nano scale sound and light communications are closely related to instances of consciousness, as Brier would describe them from the point of departure of autopoiesis and semiosis. If these theories have any truth in them, instant quantum networks of the cell structures and connective tissues in the body would, if we choose to see them as endosemiotic systems, be interpenetrated directly by the sound, vision and touch of the installation, because sensory input would create effects not only in the nervous system and brain, but also in the global proton conduction systems at levels of quantum superposition. Parts of the organism would be excited, as Oschman writes. They would again interpenetrate the molecular systems, and the psychic system, and cause affects (Massumi, 2005) and feelings (phenosemiosis) in multiple recursive loops at several different scales of spacetime. In this view, the physiological basis of feeling and sensation is certainly more than the interaction between periphery sensory cells, nervous system, and brain, even if it includes such. It is because of the wideness and global character of these processes that they can become so crucially significant for thought processes.

The fact that *Blue Morph* creates affects in particular ways not only concerns *Blue Morph*. It concerns all experiential situations in which the human being is involved. But having led ones attention towards nano scale light and sound, together with seeing *Blue Morph* through the eyes of an ideal user, allows and provokes us to contemplate levels of sensation that could be involved in our own sensuous and cognitive experience, but towards which we have not been accustomed to direct our attention. It seems to play a crucial role, whether, we direct our attention or not.

9.5. Phenomenology, phaneroscopy and evolution from the inside

With Ho I have implied that consciousness could be related to scientifically signified phenomena of light and sound at quantum levels of the organism. If this it so, and let us speculate that it is, there could be a relation between what has formerly been sensed through meditation and active philosophy as the silence of phenosemiosis, and the current technoscientific experience of nano scale light and sound. This could point towards an evolutionary development in the overall, cultural, signification spheres where we are becoming acquainted with new levels of signification and possible interpretation relating our understandings of consciousness more directly to the flesh and blood physical body. We are becoming acquainted with new levels of ourselves as a species. I will try to explain this thesis more in the following paragraphs.

First of all, I must take us into a deeper dialogue with the ontological and philosophical levels of Brier's theory. This would necessarily involve the metaphysical aspects of Peirce's philosophy. My suggestion is concerned with the issue of introspection and

inner experience, raised by the communication of *Blue Morph*, and a further question concerning the quality of phenosemiosis as an instance of consciousness that, apart from presenting a realm of experience, could also have a functional role at an evolutionary scale.

Since firstness in humans and other living organisms, if we follow Peirce's philosophy, would be an instance of the same nature as firstness in the universe at large (in a non-materialistic cosmology), which develops by evolution, takes habits and generates structures (secondness), there could be a relationship between consciousness and mechanisms of cognition in humans, and consciousness and some regularities of the universe. The fabric of universal firstness (I call it *fabric* in an unspecified sense. There could easily be particular qualities involved, however, at this moment we are not able to specify such) could be connected to the fabric of firstness in ourselves, and distribute elements of secondness in both realms that take similar properties or are connected in some sense. Brier (2008, p. 487) himself points towards something likely with a quotation from Peirce that relates mechanistic properties of nature (secondness) to cognitive properties of human minds. The idea of inner evolution also lies in part as a consequence of Peirce's phaneroscopy. It places an inherent, evolutionary perspective in its phenomenology together with a telos related directly to thought. Peirce's telos and thought are primary and universal, as opposed to purpose and thought as expressed in species-specific ways in humans. The necessity of evolution of consciousness, followed by developments in cognitive potential, in general further lies in Briers combination of Peircean phenomenology with Humberto Maturana and Francisco Varela's idea of autopoiesis, where the development of cognition in a species

through structural couplings builds upon evolutionary properties as a central prerequisite.

My suggestion is that the mind signified in firstness as phenosemiosis in the processes of the human being, is extending the potential physical realm of the human body structure in relation to sensation, perception and cognition as a consequence of the present time in evolution. As this development happens at the level of phenosemiosis, it would be a pre-linguistic experience that might not enter thought semiosic processes in any kind of immediate manner. The extension of accessibility of consciousness in the organic, human body would have two general outcomes:

1. It is, in part, directly or indirectly, becoming accessible to the intellectual mind, and from there signified in cultural semiosis (through for instance technology assisted art concerned with nanotechnology and bio-electromagnetism[31]

2. The nature of phenosemiosic processes is altering, and this would affect the relations between states, elements, structures, and levels of invariance and closure[32] in the organismic structure from within. The physical and energetic structure of the body, thus, might take on new and more complex habits (this

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[31] This field is concerned with electromagnetic functions in the organism that extend from electrification of neurons, into cell membrane potentials, and the possibility of global electron and proton conduction within the whole of the organism. Mae Wan Ho and James Oschman are both working with bioelectromagnetism. See the International Journal of Bioelectromagnetism for further information: http://www.ijbem.org/ and the International Society for Bioelectromagnetism: http://www.isbem.org

[32] Vocabulary taken from Richards, 2010 on definitions of cybernetic systems

means that our ability to sense and feel could be extended from within our physical body as part of evolution).

A consequence of these two hypotheses would be, for one, that not only the semi-stable structures of cybernetic, autopoietic organization that, according to Brier's model can be seen as part of what makes people individual entities (the black boxes of cybernetics), are understood to be affected by evolution. It is also that the nature or quality of consciousness working as a flux of communication in humans as mind or pure feeling would alter its effects on the human body. It would be extending its realm, affecting the organic structure and organization from within. It does so, because it carries evolutionary properties as part of its quality, like the rest of Nature. Due to these alterations, the ability to focus inwards on instances of pure feeling would inhere an actual potency when it comes to future perspectives of gaining insight and creating new cultural significations regarding Nature, both inside and outside ourselves. To some extend, the presented emphasis on introspection seems to bring us back to Descartes' meditations. However, in the presented perspective, the full flesh and blood of the (scientifically signified) body from quants to molecules, cells, organs, nervous system and skin, *and* our most central technological experiences has furthered the scope of observation, and the existing vocabularies at hand.

It goes without saying that if phenosemiosis becomes signified (in cultural semiosis), then it is no longer phenosemiosis. Because as Brier describes it, phenosemiosis is pre-

linguistic. It might rely on the protosemiotic processes of biosemiosis. But it is not signified in intellectual thought processes, coupled to the socio-communicative, autopoietic language games that are shared and developed at intersubjective levels. Thus, we can only think of this evolutionary property as happening in the active exchange between interfaces that cross boundaries between different kinds of semiosis, and between autopoetic and semiosic processes. Biosemiotic processes would directly interface with phenosemiotic processes, which would again exchange with, or affect, the many kinds of thought processes that humans can have. My addition to this scheme would be a further, speculative proposition: *that the dynamics and refinement of interfacing in the organism could be seen to have self-organizing, evolutionary properties based on syntropy* (Albert Szent-György, 1977, and Luigi Fantappié, in Corpo and Vanninni, 2009 have both operated in original ways with the concept of syntropy) *rather than entropy or negentropy*.

Syntropy would be a property particular of the living organism, and has to do with its ability to perfect itself from a point of departure of the micro scale level. This relates somewhat to the telos of Peirce's phaneroscopy, and it relates to our ideas of the potential relationship between quantum biological processes and what we usually understand as properties of consciousness.

We already know that the foundation for human consciousness, and self-interpretation through extended cognition and consciousness has happened physically as part of

evolution with the extension of the brain by the neocortex in the latest version of Homo Sapiens. Susan Hart (2006) writes with Jaak Panksepp that the evolution of our species seems to have typically had long periods of stability, followed by explosion like expansion (p. 25). The contemporary increase of interest in human consciousness on a broad, global scale could point towards a likely contemporary explosion of evolutionarily based properties relating to consciousness. It is said that there is still much unused brain matter, just like the dark matter of the universe seems as extensive as inexplicable. There could be equally more at the level of the global, in-vivo bodymind, which we have mentally and materially not yet realized. If we can see ourselves as expanding from the inside, then the idea of being implicit observers inside a material universe, as suggested in Otto Rössler's (1998) observer dependent theory of endophysics, might seem less claustrophobic.

9.6. Conclusion

In this case study, I have examined how intellectual interpretation of technology assisted, contemporary art is possible. I have applied central theoretical terms from Briers cybersemiotic framework, which also includes a deeper, philosophical speculation concerning a potential current, evolutionary process influencing upon our ways of being conscious as humans per se. In relation to *Blue Morph*, Briers model and terms make me able to divide and relate semiotic processes at different levels and with different characteristics, both in relation to the artwork and in relation to the user. The establishment of an ideal user forces me to define a human subject that extends from divisions usually made in each corner of Brier's cybersemiotic star, and to seek for explanations that can tie elements from each corner of the star together in new,

meaningful wholes. Interpretation through the ideal user makes me able to see *Blue Morph* as a contribution to the research of human consciousness, and to explore the possible connection between consciousness and human physiology.

Besides from investigating an art installation from a semiotic-hermeneutical perspective, I have used the theory to make further inquiry into a possible development of the phenomenological understanding of the human being, and the relationship between phenomenology as philosophy, phenomenology as science, phenomenology as design, and phenomenology as real time, subjective experience. I have further placed a process oriented, evolutionary, time aspect into the relationship between bio-, pheno- and thought semiosis, which indicates an alteration in the quality aspect of phenomenological experience as part of our evolution as a species. One consequence of such a proposal is, if it has any truth to it, that our ability to observe our own evolution has increased, that the focus point of human evolution would be consciousness, and that this development is closely connected to developments in technoscience.

Furthermore, when understanding the role of amplification and augmentation of the senses and general mediation through technologies and media, we realise how problematic it is to understand phenosemiosis as bearing any kind of stable characteristics. It might be that to Brier phenosemiosis is pre-intellectual and pre-linguistic, and therefore indefinable. This is also what makes it difficult to claim that alterations take place at exactly this level. However, in the interchange between

phenosemiotic streams of consciousness, cybernetic pattern fitting, and triad semiosis at biological levels, the dynamic perspective that lies in Peirce's agapistic evolution somewhat supports the stance that consciousness in humans can alter at an evolutionary basis. A characterisation and detailed distinction between biological properties, information and sign qualities, interfacing with such of phenosemiosis in concrete processes, are, however, by no means made at the current moment.

The orientation presented in this article implies an expectation towards a real potential when it comes to furthering our (self) understandings of pure feeling by the aid of technoscience, and technology based art, together with a renewed focus on the process of introspection. As a consequence of this, new semiotic terms and meaningful texts related to such understandings can emerge. An interchanging dialogue between the empirical sciences, technology and semiotic approaches that results in culturally negotiated significations concerning new realms of sensation and qualia related to biological empirical experience (such as the biophysical results of Wan Ho, or the nano scale signals of *Blue Morph*) would in itself represent a sign of evolution, relating directly to our common state of collective, conscious awareness.

It must be said, in the end, that all though I emphasize the role of technologies, it is no claim that technological aid is by any means necessary to expand awareness of the subtle processes inside ourselves and their relation to the autonomous, generative processes of thought, and our own intellectual willed handling of such.

Chapter 8, Case Study 4: On light - and the flux of informative events in Nature and technologies

10.0. Introduction

In case study four, I will move into deeper, integrative speculations concerning the role of light in the relation between human consciousness and the surrounding world. This case study varies from the others by combining a religious and mystical philosophy with a technological and art based approach (syncretism). Concretely, I will explore the possible connection between light and mind as a prevalent idea throughout the history of Eastern and Western cultures, and examine it in a contemporary context, the last of which is mostly based on the study of new technologies and the way they influence upon the knowledge that we can achieve today, where the area of photonics is gaining a still wider influence, and lies as a central technological tool for the generation and maintenance of the physical structure of the world wide web.

Oschman's biophysics of energy medicine contains a hypothesis suggesting that the body uses holographic information as part of the processes running in the bodymind. In this case study, I would like to further investigate the influence of light both within the bodymind, at the intersection point between biology and consciousness, but also at an overall ontological level. I will establish an exploration of thought that stages the possible connection between light as central to biological processes, light as an information storage property in electronic and biological tissue, light as a connective

communication pattern in and between humans, and also in and between planets and stars in the cosmos.

The artworks that I have chosen for this case study are Christa Sommerer and Laurent Mignonneau's *Phototropy* (1994), and UVA's *Speed of Light* (2010). The reason for integrating studies of light art (UVA) and art that works with conceptual ideas of light (Sommerer and Mignonneau) is that technologies and technoetic art communications evoke new understandings and generate new metaphors that can be applied in new, conceptual explanations. Again, art installations add to the overall epistemological approach to the question of how to understand the knowing human subject. Light is central in many biological and physical processes, and we have to ask ourselves of the relation between light in non-organic material, and light in organic material and where our own place as human subjects would be in this landscape. Technologies that are based on light, teach us more of the phenomenon of light, in particular the lasers of UVA's *Speed of Light*.

I will commence with a short, historico-philosophical survey of philosophies concerning the connection between light, consciousness and human knowing.

10.1. Religious and spiritual concepts of the connection between light and human knowing

In Christian theology light is understood as directly connected to human knowledge. In Buddhism, enlightenment is central. It is in no way like Western enlightenment. It is rather a spiritual path towards expanded consciousness and a higher state of being. Ancient Persian traditions such as the *School of Illumination,* which form part of Persian mysticism, offer an extensive framework that connects light to human knowledge, the idea of the soul and its connection to the body (Suhrawardi, 1155-1191). This means that the apparatus of perception is understood to be the soul, which is based on light. Objects perceived represent an "essence", which is based on light structures.

Where Alhazen (965–c.1040AD) in Iraq is well known for his early attempts to create an empirical science of light, presented in the extensive volume called *Book of Optics*, the Persian philosopher Suhrawardi, a century later, in Persia, presented a school of philosophy that was primarily based on light. Where Alhazen was interested in empirical testing, Suhrawardi was interested in God, soul and consciousness. Of the two, it is AlHazen who became known in the West, and is still mentioned in the science of light today (Zajonc, 1993), whereas Suhrawardi has not attained widespread attention. Suhrarwardi was, in part, inspired by Plato and Aristotle, however, his philosophy can, to a high extend, also be viewed as a critique of Peripatetic philosophy.

Suhrarwardi's ontology presented the idea that light is the original source of all being, which originally started with *the light of lights*. From this point, light moved into descending orders of still greater diminishing intensity. At a certain point, an array of

light was formed that informed the manifested world and the species of the earth; in part this happened through the formation of Platonic geometrical forms, which would then belong to one level of virtual light, which interfered and created the forms as a prerequisite for the space and objects that we as humans inhabit. The connection to other realms of light would be there, however, indirectly. The original light of light was immaterial.

Were we to transfer this framework into a current setting, with the knowledge that we have today, light in the universe would be but one level of descended, or slowed down, light. Stanford Encyclopedia[33] says with Ziai, 2003 of Suhrawardi's conception of physical bodies:

> 'Suhrawardi even revisits the classical theory of the ten Categories which (as with theStoics) he lumps together and reduces to five: substance, quality, quantity, relation, and motion, of which the latter four are accidental categories. The Categories now become 'degrees of intensity' (or perfection) of light that entities possess and that they emit, rather than being merely distinct 'ontic entities.' (p. 452).

As such, the degree of intensity (with its corollary 'weakness') of light becomes a property of substances as well as of accidents." Stanford Encyclopedia of Philosophy further writes of the connection between human perception and the world: "Between the two, the psychic *pneuma* functions as an intermediary that is able to receive images,

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[33] www.plato.standford.edu/entries/suhrawardi

forms or 'icons' of metaphysical realities that it then reflects and manifests into the soul." Were we, once again, to understand this in a current mind frame, it could back up the idea that something such as geometry, mathematics and other symbols have a virtual shape as a part of Nature, which humans can capture, however, not by logical thinking. Suhrawardi thus presents the idea of light as a main interface between the psyche and the body, and between the human subject and the world. Suhrawardi determines vision to be the dominant sense, however, in reality it is the soul that perceives. For this reason, the brain is but a material sub-category of the body's perception, which is made by the whole, which is the soul, made of light. The soul can be educated to experience light frequencies in other souls or objects, and to perceive mainly through this interface. And we must note how this skill demands practice. Intuitive knowledge is, to Suhrawardi, recognition of light in matter with low-intensity light, or of pure light in one of its different stages.

If we are to relate the presented philosophical ideas to insights gained through the case studies made in this thesis, we can both think of Wheeler's (2006) tacit knowledge, but what comes even closer is Oschman's concept of intuition and connectivity in holographic information. Intuitive notions of an object then are perceived by functions of the living matrix, rather than by regular perception through the nervous system and brain. Our understanding of tacit knowledge and intuition would then be at least partially defined by the idea of biological storage and distribution of light in the physical body, consisting of a variety of local-global systems and organs through wave interference patterns. And we can further relate it to the idea that intuition is tacit

knowledge that can become available to the day conscious mind through thought semiosis and cultural semiosis.

Suhrawardi's teachings had a wide influence on Persian thought, although he himself ended up dying a martyr's death. Similar thinking, concerning a connection between light and consciousness, can be found in the science-philosophy of Rudolf Steiner (2001), who was a physicist by education, however developed esoteric knowledge. Steiner carried out empirical physical research, but connected it to a spiritualist vision of mind and consciousness, inspired, in part, by the German poet Johan Wolfgang Von Goethe. Steiner presented holistic theories, where typical Western theories were reductive and analytical. Because of his esoteric approaches, he has not been widely acknowledged within a scientific context.

10.2. Suhrawardi and Peircean ontology

So, according to the ancient philosophy of Suhrawardi, there is more to light than meets the eye, literally speaking. And even more than would meet current possibilities in research, based on available instruments and techniques, including digital modelling and spectral analysis, if light is connected to an immaterial consciousness, first and foremost. If we were to liken Suhrawardi's philosophy with that of Peirce, light, would be inherent at the level of firstness and be part of pure feeling. However, the ontology of Suhrawardi goes deeper than the philosophy of Peirce, because of the many levels of light intensity that exist before matter even arises. This would demand a levelling of firstness.

With Suhrawardi, we would have to broaden our view on the virtually real, and the potential for moving into ontological depth at this level. And were we to describe deeper ontological levels, we could not use terms that rest on physicality, which makes it difficult, and demands a metaphorical approach. I will move towards a proposition of a deep ontology based on light in this case study, in order to examine its theoretical potentials. I will deepen my view upon levels of immaterial ontology in part three, chapter one: *Time and Relativity*.

Suhrawardi viewed the human subject in a holistic manner, where the brain was a sentient organ among other sentient organs, but not the main processor or producer of consciousness. What I mean to imply by bringing in this philosophy, is not that Suhrawardi's model might apply today. However, that there are likenesses between the concept of extended sentience, and Suhrawardi's idea of how the human being is conscious and sentient from a level that is beyond that of regular biological processes. The concept of extended sentience provides more empirical detail, because the level of the artefactually real is not equal to that in which Suhrawardi lived. At the philosophical level, there could be an overlap, however, between the dynamical objects that I am trying to capture, and the dynamical objects that Suhrawardi studied from a historically and geographically distant position.

10.3. Light and the material universe

Today, it might be difficult to see the relationship between human knowledge and light, beyond the fact that knowledge about light has been extremely important for science

and technology in the West. What happens today, however, when it comes to information technologies and the area of holistic biophysics, is that the ability to detect and manipulate light at the scale of single photons gains increased importance, while a connection between consciousness studies and studies of light gains still more relevance. On that basis, it makes sense to ask the question of the connection between light and consciousness once again. If it turns out that there is a connection between light in the biological organism and consciousness, this will also affect the way we understand the human subject, and the overall process of human knowing.

But what are the main ways in which the study of light affects our understandings of the world and ourselves? Light is an essential part in the way we perceive and understand the world of objects today. It is central in knowledge generation:

At the outer, physical scale (noemic observation), light is what makes the world of matter accessible to us, and eye vision is often understood as a dominant information source. In this sense, light plays a huge role, because it is what gives us perceptive access to the world of objects (objects are perceived as a range of light frequencies, ordered in particular patterns). The way we understand the physicality of light, and how it operates in connection to eye vision plays a central role, then, in how we understand the relationship between the world and ourselves. This has traditionally meant that ways in which we interpret the influence of eyesight on perception and cognition has become decisive of our further interpretations of space and objects in space. Naturally, as I have mentioned, and which is implicit in the concept of extended sentience, sensation would always be synesthetic by nature. This means that at a

molecular level, connected to specific areas of the brain, and neuron activation, the senses might be partitioned; they use different receptors, which, again, activate different brain areas. However, at the level of extended sentience, this partition might not be relevant. The wholeness and global nature of sensation at this level, could relate to Suhrawardi's soul. But if perception is synesthetic, and if there are new realms of sensation to discover, then what happens to the academic and the phenomenological understanding of space and objects? The focus upon eye vision and the meeting with the external world through eye vision might be preliminary of classical Positivism. This role of scientific interpretations of eye vision, of course, has been problematized many times (for instance by Marcel Duchamp, 1975). However, classical ideas of perception still seem to play a central, but unacknowledged role today.

But it is not only in ordinary perception that light plays a central role. The theory of the Big Bang, which must be characterised as a basic Western ontology, is built upon the idea that light grew out of the plasma state of the early universe, and that the backwards reflection of light can tell us about the motion and evolution of the physical universe. It tells us about the formation of stars and galaxies, and of the chemistry involved. Light, according to Einstein's relativity theory, is furthermore one of the only ubiquitous constants in the universe. The speed of light thus forms a central measuring parameter in our basic, epistemological understandings of the constitution of the Universe. If the speed of light was not constant, for instance, this would change our conceptions of space and time (relativity theory already does) Light is thus both a central concept in

our basic ontology, and a measuring device when it comes to seeking out new cosmic territory.

Matter absorbs and reflects light unequally, according to the fabric of the particular material, and the differences in reflection of light from different materials is what gives objects shape, and what makes the world appear in colour. So light is central both in how we gain information about the world, and how we interpret it. But, what happens, if we discover that light is also an intrinsic, and perhaps essential, part of ourselves and our biological mind, and not only relevant when it comes to the relationship between the eye, day consciousness, and the surrounding world?

10.4. Light as bio-information

According to Marco Bischof (1995), DNA emits and absorbs light at very weak frequencies. A system of photon emission can, according to Bischof, account for a laser like transmission across cells of the global body due to the dynamic, and spiral structure of the DNA molecule. Biophotons can become coherently structured, and operate in a variety of frequencies at many spacetime scales, which gives it capacity to carry high amounts of information bits. In the same book, Bischof further references the founder of the International Institute of Biophysics in Neuss, Switzerland, Fritz Albert Popp, with whom he has cooperated through a number of years. According to Bischof, Popp finds that photons are what cause coherence, which is a principle of organization, which again forms the necessary prerequisite for chemical processes in cells. This theory is an

extension of Oschman's otherwise complex framework, which mentions photons, however, does not go into detail with the topic. The theory of biophotons implies that cells, tissues and organs are informed by light structures that work both locally and globally, much like an endosemiotic internet which, due to its quantum properties, also is able to communicate across the boundaries of the individual (in part, because quants are not particles, they are clouds that can exist freely in spacetime).

As we recall, Mae Wan Ho (2008) and Bischof both suggest a relation between the biophotonic information system, and properties that we currently understand as consciousness. This means that the biophotonic organization would be one element that works as consciousness in the organism; and this implies all living organisms, not just human beings. But it also means, to Popp, that coherent biophotons form an interface between the day conscious mind and biology. This brings us back to the relation between light and human knowledge. If we were to move back to the central question posed by Brier, concerning signalling, pattern fitting and semiosis, it would at this point be unclear, whether the emergent properties of biophotons should be viewed as function based on pattern fitting (pure relation), or whether they would be semiosic (interpretation). If they are semiosic, they demand interpretants in order to cause events such as cascades of chemical processes in the cell. In order to know more of this topic, we would have to study in detail, how the body interprets the information that these biophotons provide. I would say, however, that we could hardly talk of communicational networks based on biophotons, without simultaneously suggesting

semiosic properties. The information of photons seems to trigger further chemical processes, which again demands interpretants within the biological structure.

If there is indeed a relationship between quantum scale biological activity and the day conscious mind, taking this seriously into account leads us to a moebius strip logic, where there is no clear-cut distinction between biology and philosophy, noetic (inner/quantum information) and noemic (outwards/matter information), large or small, mind or body, matter or non-matter. Depending of course upon the ontological weight that we give the concept of physical light and the kinds of consciousness that the biological body presents as opposed to the kind of consciousness that arises on the basis of the day conscious mind. And then we have to ask: is insight in the existence and function of biophotons going to be ontologically decisive? Or are we exaggerating the meaning of quantum biology by doing so? Before trying to answer such a question, let us dare to slide around the moebius strip just suggested, and experiment with some alternative explanations of the relationship between light and matter.

10.5. The space medium

Physicist Milo Wolf (2008) claims that the electron is the simplest matter structure. It's basis is the behaviour of an ingoing, and an outgoing spherical wave that together form a standing wave. The standing wave has higher density at the center, which appears as a particle in a microscope. In this framework, the nature of all matter would rely on the appearance of waves that oscillate in resonance in more and less dense points, creating

lattices of wave interference, out of which space and space properties appear. One of the central principles of the Space Resonance Theory (SRT) is that waves in a common lattice seek the lowest possible common amplitude. This happens in atoms, molecular structures, and more complex structures forming the world of matter. Thus, the basic principles of the space medium are: sensitive communicative awareness, and *behaviours* of interfering waves. What physicists have typically observed, when describing energy, according to Wolf, is signs of energy exchange, not energy itself? We have thus moved our concept of energy one bit deeper at the ontological level. And this is important when we seek to understand properties of consciousness in relation to such of physics and biology. This concept of energy and information, which then become properties of pre-space, fits somewhat with Bischof and Popp's idea of the photon as an information source that drives chemical processes in the cell, and perhaps also with Ji's idea of the gnergon, where information and energy become one. But it does not go as deep as Suhrawardi's philosophy, which has a levelled concept of pre-space.

We do not necessarily have to take Milo Wolf's theory at face value in order to play with the thought of yet another, ontologically deeper level of physicality. And as mentioned, the integrative method through formulation gives an opportunity to observe through articulation. It is the work of the generative philosopher to establish well-founded theses, in order to think of new connections, connections not yet fully explored at the level of academic practice. In this case study, the generative philosopher has been demonstrating assimilation of basic components in the Big Bang theory, which are, by now, understood to be common sense for the schooled person, since it represents basic physics, and from there entering the thought experiment.

10.6. Light as communicational energy exchange

According to Wolf, there are no photons. There are only processes of energy exchange, that, when they happen between the wave structures of the smallest measurable entities, electrons, result in an emission of light that appears as a photon in the matter realm. The speed of quantum waves is approximately 300.000 kilometers per second. Light, as it shows in the space resonance medium, would thus be the most direct expression of space medium information exchange, and it would follow the natural speed of EM (electromagnetic) waves as it appears. Light appears in space as EM waves travelling mechanically from one spatial point to the other. But relating to SRT, EM waves would rather be an overall sign of energy exchange happening in the communication between already connected oscillation points at the level of pre-space information, which then appears as a spacetime event. These oscillation points cannot be related to ordinary four-dimensional spacetime.

As I see it, however, for the relationship between pre-space information and the space medium to make sense, there would have to be a reversible communication between the space medium, and pure information as well. Thus, space could potentially create effects in the information realm, and this would give the virtual some kind of time property, at least in the moment it relates to four-dimensional space and matter. This, then, would form the offset of the virtually real, or one of its characteristics. It would be part of the physical interface between levels of emergence, or, we could call it diverse physical densities. If we believe the basic ontological level of the Universe to be best described by terms from physical science approach, that is.

If we add the physical philosophy of David Bohm (1980), then what he understood as enfolded orders could be seen as a set of non-computational algorithms underlying the structure of space and space phenomena, in the form of quantum wave patterns. Light as a sign of an energy exchange becomes executable information, not only as a function and property of its material existence (even if photons are massless), but also as a sign of codes from the enfolded order. An information pattern (dynamical object) could, in principle, be distributed in a number of spacetime relationships. There would be essentially no time (perhaps only 300.000 km/sec) nor space between them, even if in four-dimensional space, they would appear very different (for instance in a fractal structure across scales). But let us broaden the picture by studying the chosen artworks for this case study, in order also to let art and technologies add to the narrative and inquiries made here.

10.7. Phototrophy

Christa Sommerer and Laurent Mignonneau's work *Phototrophy* (1994) explores the relation between light and living systems. The installation presents an environment of Artificial Life (A-Life), that allows for a relationship between the evolutionary behaviour of a (digitally) virtual world, and the behaviour of users in the so-called real world. The central navigation tool is a flashlight. The theme of the installation is based on the biological idea of phototrophy, where plants have an intrinsic urge to grow towards sunlight.
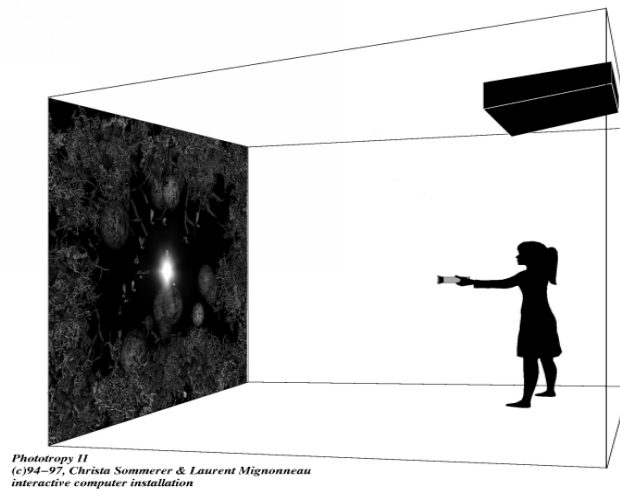
Figure 10: *Phototrophy*. By Christa Sommerer and Laurent Mignonneau
Taken from
http://www.interface.ufg.ac.at/christa-laurent/WORKS/FRAMES/FrameSet.html

The virtual insects need light to grow, and reproduce, but can also be damaged by too much light. A sensitive balanced control is needed between users and A-Life world. Even if the living creatures are insects and not bacteria or plants, we are reminded of the central relationship between the cosmic rays of the sun and organic life IRL (In Real Life), by the ability of plants to bind and use solar energy chemically (which humans then take in through a diet of greens), and for sensation and perception. It is not, however, the biological concept of light as a life source that is of interest here. It is rather the symbolic implications of the interface that links behaviours, as light forms the path to interaction between the real and the (digital) virtual. Light functions as an oscillating behaviour that connects the choices of the holder of the flashlight, with the development and behaviour of the virtual insect species. Light, at the symbolic level, is then an interface between two different realities, or two different dimensions of reality by which light, to the artificial creatures, is the only visible sign of the world on the other side. This, we could relate to the above framework, in which light is the primary

visible sign of energy exchange between virtual information and the space medium, and we could contemplate further on the implications of light as a sign of an intelligent, oscillating relationship between enfolded and outfolded orders.

10.8. The Speed of Light

The Speed of Light by the London-based artist group UVA (2010) is based on a series of installations that was exhibited in London, in April, 2010. The purpose of the works is to acquaint the public with fiber optic technologies that are central to modern communication, particularly broadband Internet. Fiber optics is based on very thin glass strands that allow travelling light impulses to float and carry information.
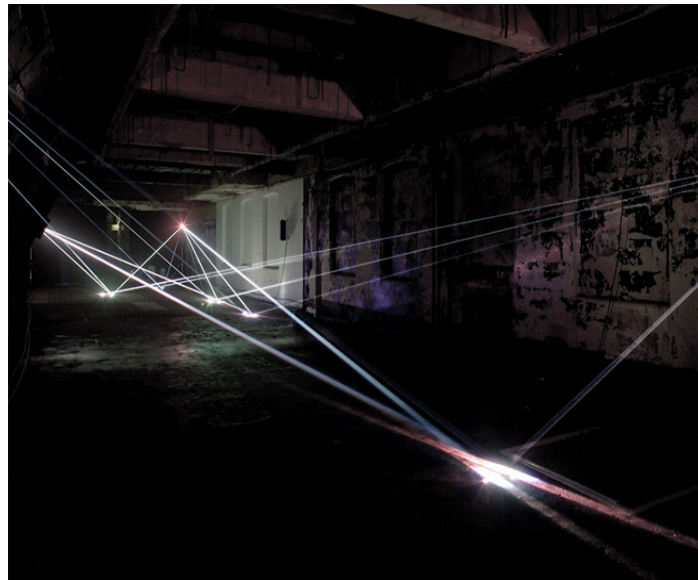
Figure 11: Scene from UVA's *Speed of Light*
Taken from: http://www.uva.co.uk/work/speed-of-light

The Speed of Light is not a deep and provocative technoetic work. Its relevance lays rather in the way it points towards the ability of light to carry large bits of information at the quantum scale. The installation is arranged so that the voices of users, answering emotional laden questions into a microphone as they enter the warehouse, are closely tied to the light scenarios presented in a variety of rooms inside a four-story building. Each room has its own story. One room offers a setting where a sofa and TV appears as sculptures made of light tubes that illuminate the darkness, perhaps indicating to the ideal user a process of light coming into formation? Another room allows for an experience of lasers, forming geometric patterns in the air as they interfere by the linear qualities of coherent light sent out from lasers in different positions of the room. The installations form a constant interplay between light and darkness, between light and space, and between sound and light. They present a variety of functions and qualities of artificial light connected to the use of fiber optic technologies. From here, the user can contemplate relationships of light, matter and information at the scale of the gross senses, and perhaps, indirectly, gain insights from processes happening at the level of the five senses, the levels of quantum information and biological photonic motion as part of internal semiosis.

10.9. Lasers in hardware and wetware

Bischof describes photon networks between cells, where the laser properties are distributed from cavities formed in the kernel of the DNA molecular structure, which allows storage, transmission of biophotons, and amplification into laser light. The idea of laser light transmitted from cavities, carrying huge amounts of information has equivalences in contemporary attempts to create, for example, nano photonic crystals.

Nano photonic crystals are based on cavities in materials particularly suited, and in which single photons can ideally be captured, manipulated, and used to structure information on behalf of laser properties (Bjarklev, Hansen & Smit, 2011). The vocabularies of biophysics, and the physics of photonic technologies aimed towards quantum computing do have some affinities, which implies a possible mutual influence similar to what we have experienced in the development of the digital computer and the theoretical province of cybernetics, and later on: the cognitive sciences.

Bischof (1995), with Popp, however, emphasizes the ability of light to operate at many frequencies and wavelengths in complex dynamic structures, which could account for the difference between the living organism versus the less complex information patterns of dead material. He even suggests an evolutionary development, which implies an expansion in refinement and complexity in light structures in living organisms. In this line of thinking, dead material, even advanced optic technologies, would always show less degrees of complexity, than what can be found in the living organism. If we were to liken biophotonic coherence internally and externally to the boundaries of the individual to the broadband internet, the human organism and its relationship to Nature, including other human beings, could inhere likely properties, however, it would inhere a much higher degree of complexity, and provide more dynamic broadband canals (internally and externally) for transmission of information; and the organic network would have the capacity to carry more bits than information networks based on fiber optic technologies. It is the reduction and captivation of the functionality into material space, however, that allows us to contemplate the mechanism.

10.10. Information flow in Nature and technologies

If we investigate the idea of semi-closed systems interacting in nature, then perhaps we see a macro effect of energy exchange in the ecological relationship between cosmic solar rays and living organisms on planet Earth, and a micro effect of energy exchange happening by photons emitted and absorbed by human DNA in cell nuclei, such as suggested by Bischof; and perhaps, we can hypothesise, there could be a fractal similarity in the properties of information distribution and structure by pure information causing energy exchange at both scales. Following this line of thought, we can see our cultural interpretations of such connections in the areas of optics and photonics (Zajonc, 1993; Winn, Meade, Johnson, Steven & Joannopoulos, 2008; Bjarklev, Hansen & Smit, 2011). As Bischof suggests, the sun seems to have more functions than merely providing light for the visual sense, for vitamin D generation, for photosynthesis, and for heating the globe. There might be a further moebius strip connection between macro-scale and micro-scale light information that builds upon the dynamic interface of the resonant space medium in which matter appears, and of which all we have detected so far are the outfolded energy exchanges of measurable light (EM-spectrum). Since four-dimensional space is, according to both Wolf and Bischof, not the only reality, it makes sense that properties can be connected according to other premises than those of traditional spacetime at a level that we could call pre-space. If Wolf's theory has any truth value, we can see ourselves immersed in a universe of multi-frequent, vibrating information that both informs and is informed by the space medium, affecting us at micro and macro levels, and is based on pure information, the reverse logic of which we have yet to discover.

In this scheme, it makes no sense to call human consciousness and intelligence the highest form of intelligence. Rather, Nature herself provides the highest level of intelligence, and we are mere bricks in a much larger puzzle. The kind of information that I am talking about here, cannot by any means be described by the paradigm of Information Science, as criticized by Brier, because statistical probability or pattern fitting cannot adequately describe how it generates effects in inorganic and organic spacetime structures. Furthermore, we must remember that the very connection between lattices of waves, light and the further components of matter, might be much more complex than what can be explained by physical science and theories of light. In this sense, the coordination of Suhrawardi's early philosophy on one side, and current philosophy of physics, combined with empirical research on biophotons and engineering in the area of photonics, might not seem so irrelevant. The area of photonics strives towards using light to carry and distribute information in very small physical spaces, so as to generate quantum computers, and to refine properties of information processing machines at large (Hameroff, 1987; Blümel, 2010). The area of biophotonics equally is concerned with ways in which light in its natural context is capable of storing and distributing information, which might tie to both well-known biological processes, as well as realms of what we now understand as consciousness. There is an overlap in meaning here. If we take Wolf's theory at face value, this also relates to Suhrawardi's idea of dimensions of light, where those of physical visibility, and where light is measurable by our instruments, are not the sole dimensions of light. This also relates to the metaphorical symbolic levels of the interface of *Phototrophy*, and to the idea of consciousness behind all physical manifestation.

From here, we can extend our image of Nature. We can view the ecosystem that we inhabit as extended into encompassing at least the solar system. For now, we know mostly of the relation between earth and the sun, and earth and the moon. However, if light functions as information, and the number of stars is infinite, then there is some possibility that Earth living is much more related to it's cosmic environments, than we have thought so far. If Wolf's theory has some truth-value, then not only the connection between electrons will generate light, but also the connection between stars and planets. All is connected, as in the principle of Ernest Mach, which Wolf presents as a core pillar in his theory. If we believe in a relation between light, information and consciousness, our ontological image of the universe will be connective, and based on living information, all though we still do not know how to understand either the concept of something living, or the concept of information.

10.11. Conclusion

In this case study I have presented speculations, and the most basic ontologies have been built upon David Bohm's philosophy of physics, and Milo Wolf's theory of the wave space medium. There is no certainty that Wolf's theory will last. Wolf still rests upon existing theories of the Big Bang, and does not move further into string theory, involving multiple dimensions. He only adds a deeper, basic ontological level, based on lattices of wave interference patterns at a variety of levels. We have explored possible outcomes of such an ontology, and have, simultaneously, made clear that the ontology is then dominated by explanations of physical science. We can choose to view physics as a sub-part of Natural forces, which are, in themselves, multidimensional. However, physical science discovers only one or few dimensions. Or we could view the

interpretations into consciousness philosophy as a mere extrapolation, based on metaphor and analogy, and extended into fictional explanations. I will not choose the concept of fiction here, because I operate with a different concept of reality, as demonstrated in our levelled reality. Therefore, I will speculatively go with the idea of multiple dimensions, whereas classical physics, quantum physics and the overall theory of the Big Bang, and the main parameters inherent in this theory, only demonstrates parts of the forces that they attempt to signify. What is most interesting about exploring the ontological outset presented in this case study, is, in my view, the consequences that it has on the general cause and effect relations, which again affects the way we can interpret installations, but also theory concerning how we can describe the universe and the human subject. Wolf's theory adds in the positive to Wan Ho and Oschman's ideas of a wave-based functionality in biological living tissue, which relates to what we philosophically understand as consciousness.

If we add this insight to our understanding of the point of departure of the generative philosopher, we have a shifted ground on which to determine the actuality and truth value in her position as a transcendent philosophical explorer, and a changed foundation for evaluating theoria as a dynamical approach connected to the process of becoming (Aristotle). For one, because we now understand that information is not only a property of written books, but, by far, also a property that the generative philosopher can strive for from within (remember the moebius strip between external and internal worlds at the micro scale level of light), and furthermore, because with Wheeler, Polanyi and Longo's epistemological turn, we also know that tacit knowledge is a central part of the

evolution of knowledge today. Tacit knowledge does not come from studying and analysing existing book works. However, to implement inner knowledge and tacit knowledge into written academic knowledge generation is difficult today, because the academic thesis cannot be written outside of the existing tradition of critical discourse and retrospective analysis, which, from the domination of logical positivism does not allow speculation. That, by itself, causes a cultural suffocation of true philosophical talent.

The question about deep ontology of space and time will be treated further in Part III, in the chapter *Time and Relativity.*

Conclusion, Part II

11.0. General considerations

In this project I have made a testing of vocabularies and theories that have made it possible to connect biological, psychological and social processes in a way that can explain connective aspects of consciousness, relate these to existing understandings of the body and mind, including quantum philosophy and the idea of a multi-levelled reality, and, none the least: to test these ideas against the symbolic of central technoetic artworks.

It is, in particular, the way vocabularies have been connected into a cross-disciplinary integrative syntax that transgresses the idea of brain equals mind, the idea that there are no levels of generality, besides from biological measurable such (neuroscience) in subjective minds, and the idea of the one-dimensional individual, who is separated from social and evolutionary time lines, that have been central to formulate in the project. This has resulted in a multi-spectred image of a human subject, who relies on extended sensation and aesthetic reason, based on a firm centering in embodied intuition.

On the basis of understanding the relation between bio-, pheno- and thought semiosis, it has proved valuable to integrate a biophysical framework that, in itself, delivers strong resonance with existing philosophical ideas on consciousness (Bergson, Peat, Bohm, Nicolescu, et.al.), even if the biophysical framework is not in full accordance with the

molecular biosemiotics used by Brier, and even if Brier views sign games as inferior to socio-communicative autopoietic language games; which we, in our concept of extended sentience, do not necessarily subscribe to.[34]

By moving from Brier into the framework of James Oschman, we have suggested that not only is the body constantly overloaded with sensuous information; it also structures and loads some of this information in the body, and in the right kind of excitation, the body can generate what I call *feeling* as a connective response to an outer stimuli. Feeling relies, in part, on extremely low frequency electromagnetic vibrations, but also on a heart-brain synthesis; and according to Corpo and Vannini (2010) and Bradley (2006), it can have anticipatory functions.[35] I have made the conclusion that the intellectual mind functions in a subordinate position to these processes when it comes to fastness and accuracy, but that it has a potential to "listen" to them (with or without technological amplification), and to signify them in thought semiosis at levels of the day conscious mind. This forms part of the foundation for inner knowing (including the processes of our generative philosopher).

Oschman, Ho, and Bischof have provided bio-energetic and bio-physical theory that allows for a differentiation of biological levels of consciousness, which gives us a foundation from which to conclude, at a provisional basis, that quantum biology is connected with molecular and cellular biology, and with macro scale anatomy in non-linear ways, which do coincide with levels of thought, and which we can only

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[34] But then, Brier's, in developing his theory of sign games, has not taken into account bio-energetic frameworks that integrate quantum levels into the study of the living organism.

[35] It connects to a dynamical object in a process that happens outside of macro-physical spacetime

conceptualise by philosophical language. This relates well to Nicolescu's levelling of realities, which, again, has inspired our levelling of densities. The concept of extended sentience, together with our five levels of reality provides us with a renewed point of departure from which to define the correspondence theory of truth; since the individual subject is multi-dimensional and relates directly to the external world through quantum based "imagination" (Nicolescu, 2002), and since there is accuracy in "feeling". While placing an intense focus of attention on a dynamical object, feeling becomes a sign of truth. However, this sign of truth will always have idiosyncratic traits, and must therefore be negotiated at the level of socio-communicative autopoietic language games as well. This last fact, however, does not strip the experience of truth from its reality value; it represents a certain kind of embodied perception, just like Peat and Bohm (1987) have originally suggested. The extended version of the human subject supports our re-insertion of the first person generative philosopher.

If one expects a purely strict logical syntax in the lines of argumentation and conclusion in this project, it might seem that I have presented an overall eclectic redundancy or even tautology in the respect that I have defined a topic, examined it, and have ended up with a likely conclusion as the one I made to begin with. This would be true, however, only if we judge the project through the criteria of strategies of linear progression and validation through one-dimensional classical logical cause and effect argumentation (Nicolescu, 2002), which functions at an overall objective level connected to a theoretical syntax that refers to the short time frame of a here-and-now situation. What I have done, however, is to fill in blanks that concern noetic levels and levels of deeper

meaning. This demands an articulation of processes of internal semiosis, and a consideration of how these processes can be extended and complicated, and related to traditional understandings of being and knowing. In order to fulfil this purpose, I have integrated a cybersemiotic vocabulary in my readings of technoetic arts, and in the formation of the ideal user. Forming the ideal user allowed me to further my version of the extended human subject to incorporate new levels of the artefactually real that integrate digital technologies and electronics, and thereby mixed- and augmented reality environments with multimodal interfaces; thereby also integrating a multisemiotic perspective (cultural semiosis). These environments, in themselves, represent a new level of signification, including anticipatory tacit knowledge. Although only the contours of the ideal user has appeared in the case studies, each study has provided new information and angles on the extended human subject. As the dynamical object that the ideal user is, she cannot be nailed down and captured in any strict manner. She can only be approached.

Technoetic artworks typically present numerous levels of signification, where I have, in part, focussed upon a symbolic level where function becomes sign. Technoetic interfaces present condensed and ambiguous references, where most of them are not formulated in verbal language. The mere act of establishing a vocabulary that can adequately express information extracted from artworks that, in themselves, present new ontologies and new languages, is a result in itself. I have furthermore generated a framework that allows me to attack dynamical objects, which are primarily intangible. Intangible objects demand formulation, before one can further test if there is correspondence with the respective levels of reality.

Expanding our insight of internal semiosis, which is a realm that has been banned in academia for a long time, affects many other areas of study, and in particular our prior ontological onsets for making any theory or empirical testing. In particular because it shows that internal idiosyncratic foundations are not only wide and complex; there are also levels of generality at complex levels of internal semiosis. And furthermore, internal semiosis is not set once and for all. Rather we are talking about dynamic properties that are extremely sensible, and which develop over time; even at an evolutionary scale, as demonstrated in case study three. The levels of generality in internal semiosis, along with their dynamic nature, must be taken into consideration when we understand and define what it means to learn and to know.

The project most probably leaves more to wish at the empirical level. However, a critical negotiation of accuracy and positivistic truth in the biophysical theories used has not been a central aim of the project. Testing their explanatory potential in a philosophical frame has. Critical argumentation of biophotons can, for example, be found in the book *Thinking Hyperorganisms: Art, technology, coherence, connectedness and the integrative field* (Nobrega, 2010), which delivers a solid and critical investigation of scientific research into biophotons and holistic biophysics, which functions as part of an overall artistic strategy, however, represents genuine empirical and theoretical considerations.

Part III: Philosophical ontologies

12.0. Introduction

Part III presents philosophical speculations concerning three major themes under the headlines: *Time and Relativity*, *The Life Cycles of Metaphor*, and *Logos Philosophy and Virtual Grids*. Whereas in Part II, I sought to integrate knowledge of technologies at a fairly technical level, and I was looking for explanations that relate to holistic versions of physical and biological science, Part III will mainly be preoccupied with thought experiments, and a demonstration of comprehensions made by the generative philosopher (1st person subject), which concern the formation of new ontological positions, the starting point of which are based on the new vocabularies and the logical cause and effect relations inherent in their connotations, which were derived in Parts I and II of the project. Central hypotheses and their crucial implications taken further in this part are *extended sentience*, *endobiological evolution*, *syntropy*, and *Brier's differentiated types of semiosis*.[36]

Ontology, in Philosophy of Science, is often understood as the way one understands the world and the human being in the world. In this project, I understand ontology to be related to a form of essentialism that cannot, however, in any way be equal to Aristotle's essentialism. The reason it cannot be equal to Aristotle's essentialism is that Aristotle gave this idea meaning within a cultural signification sphere that had a completely different nature than contemporary signification spheres, in particular at the level of the

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[36] Biosemiosis, phenosemiosis, thought semiosis and autopoetic communicative language games

artefactually real. The relational logic concerning our five levels of reality would be that there is a connection between potentials of thought, discourse and language game and the evolutionary state of the artefactually real. This also relates to Lakoff and Johnson's metaphor theory, where human conceptualisation takes its points of departure in experience with the world of material objects and a three dimensional space. Thus, a signification sphere that is not adequately rich in signification forms at the material level is expected to result in equal difficulty in specification by reference to pure philosophical thought (first philosophy that reaches into the most general aspects of what is, and the generation of basic axioms from this point of departure).

The basic principle, however, is that, further from the signification level of the artefactually real, there are qualities behind all phenomena that we, as humans, register through our sensuous, cognitive and conscious apparatuses. John Deely (2004) writes of Jakob Von Uexküll's "innenwelt" and Thomas Sebeoks understanding of language as modelling:

> 'Hence the human Innenwelt can represent things not only on the basis of sensation and as sensed objects are perceptually given, but as intelligible as well, i.e., able to be investigated and studied on the hypothesis that they have an internal constitution or "essential structure" of their own which may look like nothing we have ever seen or could see with the eyes of our animal body' (p. 25).

Deely is here pointing towards the fact that there are objects that we sense which can only be described though language, and which do, however, have a status as

representing real aspects of that object. With our five reality realms, we can allow ourselves to let virtual objects be included in this scheme.

Moving from a separated self with confined senses and brain dominance, to a structure relying on extended sentience, while realising that the human structure only receives a small amount of the information potential that exists in the world, also places the virtually real in an non-mystical position. It is then merely presenting levels of reality that we have not yet been able to sense and articulate. From here, and with our acceptance of an evolution of consciousness, we can simultaneously understand that we extend our repertoire over time, by sensing and articulating new intangible objects.

Brier (2005) writes that modern science cannot escape metaphysical questions, and, as we know, science builds its foundation upon metaphysical grounds (the philosophies of Greek Antiquity). I find that resisting the idea of intangible and non-measurable influences, which do, however, have a potential to be acknowledged and signified, and which clearly affect the world of physical objects (including ourselves), is an error. It cuts the heart out of the part of knowledge that we call wisdom, and results in a kind of representation that strips Nature and human beings from their deeper being. It also compromises the truly creative researcher (Peat & Bohm, 1987), who is not allowed to make explicit his/her subjective comprehensions (based on experience and knowledge as perception) and ability to work with generative thought patterns and the relation between the human mind and Nature – with an intermediate, intentional and idiosyncratic personality as well.

The historical break with essentialism presents a change of focus, made by the collective mind, which has dominated and formed Western science the recent hundred years or more. Bohm (1980) writes how the etymological understanding of the term "measure" has changed from Greek Antiquity, where measure was an expression of balance between all things. He writes:

> '…measure was not looked on in its modern sense as being primarily some sort of comparison of an object with an external standard unit. Rather, this latter procedure was regarded as a kind of outward display or appearance of a deeper 'inner measure', which played an essential role in everything' (p. 25).

This is very different from how we view measurement in positivistic or critical rationalist paradigms (Popper, 1959). But that, in itself, is no argumentative confirmation that there would not be qualities and structures behind appearances in a relationship that is far from one to one. The ontology that comes closest to this understanding of reality could be Peirce's idea of dynamical objects. Essences, in this respect, could be viewed as dynamical objects, and physical objects as representamens. We must, however, remember, that the reverse is not true: not all dynamical objects are essences.

By taking this standpoint, essences are given a signifying status. And they must be understood to arise from a sphere where everything is in constant dynamical change, and this would go not only for the materially real, but also for the virtually real and

intangible habits in Nature. This gives our triad sign relation a relative status. Simultaneously, the fact that we have divided reality into five levels, which we have given an equal and non-hierarchical value, makes us realize that all significations are referential, and never one to one with their object – even something such as Niels Bohr's famous model of the atom's structure, Feinmann's diagrams in quantum electrodynamics, or interpretations of the double slit experiment (where photons appear to change behaviours according to context). As Latour has claimed, science uses inscription devices, and translates from this stage into whole scripts, lectures, articles and actions, where knowledge changes both medium and representational form during the process. This process, to Latour, is part of what constitutes scientific knowledge, and gives it a constructionist quality, and demonstrates how human language games are dependent upon the level of development in the artefactually real.

What then characterises ontology in our context? Ontology is more than immaterial, dynamical objects. Ontology is, in my view, the deepest level of insight into Nature, which human observers are able to perceive and conceptualize at any given moment. Thus, ontology has to do with the depth of human (collective) mind. Ontology is also a meta-level from where a consistent background for all further observations can be formed. It is, to some extend, the beginning and end of any knowledgeable human conceptualisation. It starts with theoretical perceptions, and forms basic axiomatic premises for all further thought (Bohm, 1980).

All though Brier, with Peirce, delivers a well founded, deep and provocative ontology in his cybersemiotic theory, I will explore the potential of wave

based ontologies from physical science philosophers, which also connect to the schemes of Ho and Oschman. It is my claim that Brier's framework has not assimilated a non-classical ontology concerning spacetime, and has not treated how important scientific metaphors can, apart from seeing them as labels that change disciplinary domains, be viewed as signs of something actual at the level of the intangible. Furthermore, Brier has, with Peirce, pointed towards a relation between structure and relational forces in Nature, and human cognitive structures. But he has not gone into depth with this topic, and examined how it affects human knowing when it comes to (generative) philosophy and its impact on institutional practice. All in all, it does not only tell us something about Nature as thriving not only upon habits, but also upon enactive, teleological qualities that constantly inform the habits that we observe as representamens. I have emphasized that I find there to be a need for a further differentiation at the level of quality. Quality might be vague and imprecise, when we try to signify and understand it, but I am speculating that it has an order of its own. I expect that human minds, which can never grasp such overall orders with the biological equipment available through the human sensuous and cognitive apparatus, be forced to discriminate and reduce at an intellectual level in order to comprehend. The assumption that there is, in fact, some reason in essentialism, which must, however, be understood as placed in a new context, backs up the approach where theories are constructed on the basis of a semantics of cultural intertextuality, which strives towards correspondence with real essences (or dynamical objects) through the logic of consistency in explanation.

But if it is really so, then how can we test the truth-value of such insights? My suggestion is that *it takes aesthetic reason based on extended sentience, where truth can be understood as a significant event within the organic structure that appears as a sign (through feeling) to the intellect from within*. From this point of departure, any theory must prove itself through concrete processes of negotiation with peers in relevant communities of knowing, because in the end, knowledge is a process of intersubjective negotiation and general accommodation of what might have been idiosyncratic approaches to begin with.

This approach has as a consequence that the main objective of theory cannot be critical argumentation, which places too much emphasis on theory as arbitrary reference points tied to a kind of observation that is viewed as a discursive construct with no reference to a deeper reality – rather expressing social power relations than truth.[37] This, again, indicates that the objective of this thesis is to locate and integrate intangible dynamical objects in Nature, which have, otherwise, been dismissed. The main objective of Part III, thus, is to capture and discuss the dynamical object spacetime, the dynamical object of the "life cycles of metaphors", and the dynamical object of logos in Nature, and to relate them to a context of collective mind that is significant of a contemporary situation. We are here not leaving our academic heritage and epistemological foundations, but rather musing in a mix of intellectual, intuitive abductive meditations, which connect to particular instances of embodied feeling. Critical argumentation can,

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[37] This understanding is mainly postmodernist, and relates also to discourse theorists such as Foucault, Laclau and Mouffe, but to some extend it also relates to Qvortrup's Luhmann inspired idea of society.

by it's inherent rhetoric and demands upon the clarity of the confined ego-subject[38] as an implicit writer, overshadow the potential for capturing true dynamical objects. This is so in particular, because their nature could be different than such of a former, or even currently dominating socially accepted truths.

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[38] See an explanation of the "ego-subject" in the glossary, appendix 1

Chapter 10: Time and Relativity

13.0. Introduction

The question of time and relativity is one of the most basic philosophical questions, when it comes to questions of consciousness. From a semiotic point of view, time, space and the relativity of both have deep implications for how we make meaning. This is why it, further than being central in physical science, is essential in philosophy. Most often, within established paradigms, the influences of ontological positions concerning time, space and relativity are not taken explicitly into consideration. Logical, theoretical and argumentative structures are typically based on a three-dimensional material spacetime ontology with implicit assumptions of a natural linear progression based on the concept of irreversible time in cause and effect relations. Although the topic of non-linearity in philosophical thought has been debated for instance by Gilles Deleuze and Felix Guattari (1987)[39], where non-linearity in text was debated by Jay David Bolter (1991), George Landow (1997), N. Katherine Hayles (2002), Marie Laure-Ryan (2001) et.al., and the logical implications of non-locality, paradox and potential in stead of time was discussed by quantum physicist Basarab Nicolescu (2002), which again affects the linear structure of an argument, linearity is still the ideal for the traditional academic thesis, and thereby also for the presentation of philosophical thought. The linear structure is taken for granted, when students and researchers follow institutional directions and are being schooled in academic writing, methodology, and especially argumentative structure.

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[39] "A Thousand Plateaus: Capitalism and Schizophrenia"

Although it might not always be obvious, and is often left unnoticed, ontologies from physical science concerning time and space form essential backgrounds for the causality lines, on which both argumentative conclusions rely (in Feynman diagrams as well as in overall academic argumentation), and the structure of the text itself. We have, throughout the project, complicated the point of departure in a three dimensional material reality. On this basis, we might have to rethink causal relations at fundamental levels, with consequences for meaning making in the academic thesis. This is particularly relevant for philosophy – a discipline whose medium is words and meaning making through textual representation. Therefore, it is essential to relate an explicit ontological understanding of time and space directly to processes of meaning making in research contexts, and this ontology will affect our understanding of both the first and the third person human subject in question in this project.

In this chapter, I will present an alternative vision of space, time and relativity, and consider the consequences of these ontological pillars when it comes to meaning making, reason and logical causality in collective philosophical thought. I will combine viewpoints from philosophy of physical science, inspired by Leonard Susskind (2005), David Bohm (1980), and Milo Wolf (2008) respectively, with a semiotic and speculative approach. David Bohm and Milo Wolf have each in their way presented philosophy of physics that deviate from classical interpretations, also that of Einstein, whereas Susskind presents a more traditional approach that does, however, take string theory into account.

13.1. Space and time as objects in Nature

In many ways, it makes sense to talk of a mutual influence between time and space as relying on cognitive properties of the mind, and simultaneously as properties of a physical and biological reality. In this sense, time and space can be understood as dynamical objects in Nature. But they are also interpretants that rest upon human, cognitive properties that, again, rest upon our ability to systematize and structure knowledge. As we recall from case study one, sometimes mind and reality meet in isomorphic moments. But we must assume that often, they don't. The representamens, which are the signs of space and time as natural properties at the level of the materially real, are what we communicate about when talking of natural laws, through the networks of signs and meaning produced in science, art and philosophy. They are not equal to time and space as dynamical objects, but they are representative of aspects of them.

We can communicate about the dynamical object of spacetime through multiple disciplinary frameworks. Disciplines tie the levels of reality together in varied manners, where logical Positivism[40] is strongest in its tie of the ideally real (based on functions of the logical mind, most possibly a left brain dominance) and the materially real (through induction and deduction in accordance with a three dimensional understanding of time and space). Philosophy is typically strongest in its tie between the virtually real and the ideally real (through abduction and musing or intellectual meditation), and art between the virtually real and the materially real (through aesthetic reason and multimodal

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[40] For instance the classical language philosophy of Ludvig Wittgenstein

semiosis). As we recall, I have suggested viewing objectivity and subjectivity as observational forms of the human subject, which relate the human knower to the world differently, and are, thereby, complementary. They are not opposed, and the division between subject and object not mutually exclusive. In fact, there can be multiple kinds of positioning of the observer within each type of observation. Already here, we are transgressing the classical logic of A is not non-A (example from Nicolescu, 2002), which does, however, also appear as an implicit logical syntax in academic text, that structures subject, object and intersubjective ontologies as if they were mutually exclusive (either you are subjective, objective or intersubjective, but not two or more simultaneously). While taking the idea of collective intelligence and collective thought seriously, having incorporated the level of the virtually real into the other four levels of reality, and quantum theories into our biological perspective, we can potentially transgress the point of the departure that sets a confined ego up against an objective external nature, and against other ego-subjects.

13.1.1. Space, time, experience and observation

-Why does it matter?

Remembering Gadamer, we are aware that experiences can alter our point of departure at a level of consciousness. Peat and Bohm (1989) described the creative process in science, where knowing is equal to experience, and where creative thought would lead to whole new theories about the world. My explanation as a generative philosopher, who has noticed this experience within myself, is that when my consciousness alters through the kind of experience that disturbs the regularity of my cognitive habits, and perhaps pushes some cognitive structures into higher order levels, the point of departure

for interpretation alters with it. And this again can change the basic ontology on behalf of which, I operate. Mary D. Jones and Larry Flaxman, on behalf of their studies in neuroscience, say that 'every new experience causes chemical changes within the brain, and when those experiences repeat themselves, they become part of our general perception of life around us' (Jones and Flaxman, 2009, p. 144). In order to articulate this further, I will present a thought experiment, based on the logical implications of Luhmann's idea that mutations can happen in autopoietic systems, together with our concepts of endobiological evolution and extended sentience:

In extended sentience, which is built on the expectation of a high level of ease in the micro-scale biological-communicational systems inherent in the bodily structure, and in accordance with the concept of syntropy, this is prone to happen at a regular basis, especially since the structure is affected by an evolutionary process and through syntropy always strives towards a realisation of its utmost potential. If my focus in perception changes from a basis in a rational confined self, mainly operating through brain based logic and eye vision, and moves into a basic pheno-hermeneutic position that is primarily focussed in extended sentience, which inheres a level of quantum proprioception and what I have characterised as "feeling" (based on ELF electromagnetic global bio-communication), it follows that not only the way I experience the world changes, but also the causal logic by which I cognitively order it; especially because the laws of the quantum realm do not follow linear local logic (Nicolescu, 2002): cognition and consciousness at this level, are influenced by the

counter-intuitive laws of quantum mechanics. Bohm and Peat present a similar thesis concerning quantum laws and consciousness (Bohm, 1980; Peat & Bohm, 1989).

If my perception is truly embedded in extended sentience, then this, again, must be expected to influence upon my logic of signification. And we can take this one step further: given that not only I, but large clusters of individuals change their perception into extended sentience as part of an endobiological evolution, the long-term consequences, when taken into inter-subjective dimensions of language and knowledge negotiation, would be a mutation that would cause a necessary alteration in the semantics of language games in the signification sphere, because the inherent logic of thought has changed by necessity.

As viewed in retrospect, single philosophical authorships have usually been based on a stable ontological ground where a leap in consciousness that would cause a change in ontological foundation, and thereby changed logical cause and effect lines of reasoning is typically not expected. This is even more so, when it comes to a broader institutional practice in given research societies, concerning what Kuhn (1962) called the production of *normal science*. At the philosophical level, central contributors such as Descartes, Kant, Peirce, and others, might have continuously built and added to their theory, rather than making basic, ontological jumps several times during one and the same authorship.[41]

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[41] All though, of course, it does happen, just like any philosopher is prone to question his/her own work during the time span of an authorship

On the basis of the above argumentation, we can assume that today the pace in which experience is felt, due to the extensiveness and refinement of information intake based on extended sentience, together with the enormous increase in information at the socio-cultural level, and the faster pace in intra-institutional negotiation of truth and meaning value of loaded terms (terms that form a central place in an overall social semantics, often also with deep historico-philosophical reference), must by logical necessity change the relation in space and (social) time between a single lifespan and the potential insight an individual can gain from what is socially accumulated and articulated in this period. Due to these two changed factors, it follows that an individual can change ontological position several times during a lifetime, and that the connotation of central terms can therefore shift during such a development.[42] With endobiological evolution, and the increased activity in internal semiosis, we have a noetic change that might, however, not show as clearly at the noemic level.[43] The suggestion here is that shifting ontological standpoints within one lifetime is a new condition. We have thus extrapolated consequences out of our main theses of autopoietic social communications, extended sentience and endobiological evolution. In the following we will continue to do so in further thought experiment.

Since we have assumed that endobiological evolution will distribute itself in non-linear, somewhat chaotic progression (tychastic evolution in Peirce), however, with an overall

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[42] The idea of changing ontological position at a regular basis is today found in the social science paradigm of Critical Realism, suggested by Roy Bhaskar. This is in opposition to Kuhn's idea that a revolution was needed in order for an ontology to shift. Furthermore, the increased use of triangulation as research method also shows that, in many ways, we have already established practices that operate on behalf of more than one paradigm, and thus we are, philosophically, able to manage several paradigms in one overview. In that sense, there has been an evident shift already since the 1970'ies till today.

[43] The same term can be used by several theorists, while giving the term profoundly different connotations

teleological evolutionary syntropic strife (multiple evolutionary lines of irreversible time relating to anancastic and agapistic evolution in Peirce), it follows with this premise that influences based on cognitive changes, combined with changes in newer technologically based communicational forms, accessible in both academia and in lifeworlds, could result in discrepancies between the habits of individual cognition versus socially stabilized cognition. In Luhmann and Qvortrup it seems an implicit understanding that human subjects are cognitively inferior to the supra-individual social systems. The indications of our thesis, however, would lead to the open questioning of whether it follows naturally that social systems are always a one to one representation of the broad state of mind represented in a given culture, and thereby also of individuals? Points of discrepancy could concern aspects of society that we can understand by referring to Luhmann's "symbolically generalized media" (power, science, law, money, love, etc.) and the structure of Qvortrup's social semantics, but also when it comes to levels of discourse, concerning the implicit reference to time, space and pace.

Expecting human beings to have a contingent amount of free will, and with the postmodern decentralisation of power in society, and the freedom of speech represented by social media and the Internet,[44] the mutation of cognitive habits of the individual could have the potential to happen in a pace un-equal to the mutation of social habits (and thereby established systems). While taking the endobiological evolution into account, we could expect that the individual can develop a more unlimited space of contingency in mind, than a social system can, because the social

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[44] Although there is a whole discourse on the negative effects of social media, it is not within the scope of this project to take up this discussion

system must, by nature, present the kind of stability that can be inclusive of a high number of individuals simultaneously – individuals, who might, at the noetic level, subscribe to different timelines of irreversible evolution. The system must balance itself towards a common denominator – but that does not, necessarily, constraint the cognitive development of the individual. The idea behind this argument is somewhat likely to Kuhn's idea of periods of "normal science", where anomalies accelerate over time – however, our thesis is that a broad cultural and even global paradigm shift, which begins outside the institution of science, is accumulating. I will contemplate this problem further, through a re-consideration of time, space and relativity that integrates contemporary philosophy of physics.

13.2. The Big Bang as semiosic self-observation

Because physical science has been a dominant science, when it comes to forming ontologies in Western societies, conceptions of space, time and matter have been closely related to a general understanding of first Newton's laws, then Einstein's relativity theory and later on quantum mechanics (Bohm, 1980).

The theory of the Big Bang often functions as a dominating implicit ontology in mainstream Western science and mainstream societies. This supports the idea of a material world, stripped of meaning, where everything happens by chance. The field of quantum mechanics has, however, provoked existing images. Philosophy, derived from studies of quantum mechanics, typically takes the consequence of understanding that there is empty space between the elementary particles of the atom, the idea of quantum fields, un-manifested probability, and the problem of the observer

affecting the observed directly (the double slit experiment) and inserts this into a philosophy that ties together physical reality and the mind (Bohm, 1980; Laszlo, 2004; McTaggart, 2001; Hawking, 2010). The quantum level is what brings mind back into the picture, thereby complicating traditional understandings of a division between mind and matter. Evolutionary cognitive science (Goodson, 2014; Platek, Keenan & Shackleford, eds.,2007) today, however, rarely takes the philosophical implications of quantum mechanics into account, and typically built on paradigmatic approaches based on information science. This is why they have not been found useful for this project, although they form part of the background reading.

When it comes to time and space in physical science, Einstein presented two propositions to his physicist relativity theory: the special relativity and the general relativity theory. Einstein's theory expanded space into more detailed macro level observation, where science came to the understanding that all movements of mass in space and time, were by nature relative. This is how Newton's concept of inertia turned out as inadequate when talking of macro scale levels. To fulfil the needs of a theory in which all elements fitted together, Einstein had to operate with a range of constants, among which the speed of light was central. It became a central component in mathematical equations concerned with macro scale spacetime. Time was now a property of matter, rather than a finite property in and by itself. And light was understood to bend, as it was attracted to the gravity force of matter, where gravity was no longer understood as a force in and by itself, but rather as a pull generated by the dense compression of matter. In this sense, space would be bent.

From this point of departure, spacetime is relative, because all elements are relative to each other, even if there are constants such as the speed of light and the Planck constant. However, according to Leonard Susskind (2006) the greatest challenge has been that Einstein's cosmological constant, which presented the idea of a strife towards equilibrium between gravitational force and an anti-gravitational force, has not presented a sufficient level of explanatory precision. And that theories that a quantum vacuum exist have complicated the idea of a cosmological constant, in particular the idea of the vacuum being full of high frequency virtual energetic entities: a zoo of quants and quarks. Einstein's theory has not been able to explain this zoo, and it's high level of energy, which would destroy the whole universe as we know it, had it had the effects of energy that we know from our universe (Susskind, 2006). Furthermore, besides from the vacuum of virtual, potential elementary particles, elementary particles in ordinary space, demonstrate a counter-intuitive kind of presence, which Susskind refers to by using the terms "behaviour" and "events". These behaviours and events are not, however, a property of the three-dimensional space that we can immediately observe with our senses and physical presence (if we do not count in extended sentience).

The important thing here is to view the realm of quants as a set of behaviours that exist in accordance with space and time, however differently than in Einstein's four-dimensional spacetime. So, as is by now well-known, the very existence of the quantum vacuum full of loaded energy presents an unresolved puzzle in quantum mechanics; in particular in relation to the referential value of mathematics as a cultural semiosic form.

If this level is taken seriously at an ontological level, we have to ask, again, how images of the universe through the Big Bang model are represented, and how this influences upon our general worldview, and basic logical assumptions, and what would happen, were we to understand the basics of the universe in a different manner?

13.2.1 The Big Bang Theory signified at the artefactual level

When it comes to communication of the Big Bang theory to a public audience, and thereby making it part of a broad, cultural episteme, the distribution of the theory is often made by using digital virtual three-dimensional models distributed in domes and planetariums.[45] This makes the theory available to adults and children alike. The digital virtual 3D compositions, however, do by the necessity of the digital format end up staging a Cartesian three dimensional space in order to illustrate the complex theories of the Big Bang, electromagnetism, space and time, all the way from the beginning of the Universe (and thereby of time and space), represented by the microwave background. If, however, we do not believe the expanding universe to be spatial in a three dimensional sense, based on linear, irreversible time, where the limit of time is set by the speed of light, which is constant in empty space, we would have to conclude that such visual models give an imprecise representation of the dynamical object of space and time. If there is, in reality, no beginning, middle and end relating to one and the same overall dimension, then the whole idea of space and time, the expansion of the universe from a beginning to an end, and the possibility of measurement by current mathematical

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[45] Eg. Copenhagen Planetarium; Science Museum of London; FutureLab, Linz, Austria; Adler Planetarium and Astronomy Museum, Chicago.

systems that operate within this overall computer modelled, visual and theoretical representation, must come into doubt.

Furthermore, according to classical physical theory (Susskind), all the components and forces that have generated inorganic matter on Earth are present in the universe proper. The process of star formation that relies on dust particles, attracted by gravity, and held together by the strong nuclear force, and the further production of carbon, helium, and nitrogen inside stars, which can, again, sometimes lead to Super Nova explosions that provide Earth with the kinds of particles and substances that are needed in order to generate both inorganic and organic matter, are all, as far as we know, based on the same physical laws that also define physical Earth. Thus, from our current situation on Earth, astronomers and astrophysicists extrapolate Earthly experience into universal explanations.

If we were to regard this from a semiotic point of view, we could claim that every observation mentioned is based on the horizon and cognitive prejudice and intentionality of human beings relying on the socially real and the level of the artefactually real, the standpoint from which they experience. This relates somewhat to what Susskind refers to as the "anthropic principle", which claims that the universe is made in precise accordance with the needs of humans as physical beings. And if not, we could not be here to observe it.

Presented from a semiotic and cybersemiotic point of view, we could say that human beings have formed both the theories and the technological inscriptions that are behind our unified theory, which, at the sensory level and the level of instinctual need, now forms our umwelt, because our senses are being amplified through technological artefacts. This, again, informs our common signification sphere (through presentations in public domes and school curricula to give but two examples), and become deeply embedded in our language games. In this sense, the Big Bang theory dominates Western cultures, and forms a central part of the signification spheres. It is central in common sense and certain scientific self-understandings, and thus also central in the way we conceptualise the human subject.

In order to move out of this dominance, our concept of Nature is important. Because of the signifying trait of human knowing, it is necessary to operate with a concept of Nature that is always more than present stages of human knowing would be. A social constructivist understanding of the Big Bang model would lie at the level of the representamen. As the representamen of a real object, the Big Bang theory would represent the most validated versions of a cosmological theory, and because physical science has been a dominating discipline, also the most common shared ontology, today. But everything that lies outside of the dominating theories in our signification sphere belongs to Nature. This stance goes well with Peirce's theory of signification as presented in Brier (2005; 2008) and Esposito (1980), where we say that the universe per se forms a dynamical object, which we seek to capture through an immediate object (the theory).

So, to sum up, we can say that the causality line that steers the theory of the Big Bang could be inverted, so that rather, Earth reality and human conceptualizations are viewed as extrapolated into coherent epistemes that form representamens of objects that we have not yet fully understood. These epistemes are represented through language games that are distributed by signs and mediated signs in the signification sphere. They thereby become assimilated through schooling, and are embedded in the existing language games, which are, according to Brier, also, in part, in power over the individual.

As we know, the Big Bang theory is, of course, inconsistent with itself, since, within its own framework, it is only able to explain few per cent of the universe.

Today, there have been attempts to present scientific explanations within the field of physics that integrate the counter intuitive insights gained from quantum mechanics, including propositions of a multidimensional cosmos that is based on a multiplicity of micro scale enfolded strings, which again complicates our relation to time and space (Susskind, 2005; Hawking & Mlodinow, 2010). So we are moving towards an extension and re-formulation of our common signification sphere, however, with no certainty. If the cosmos is understood to be multi-dimensional, with multiple strings that form the deepest levels of physicality at micro scales, this will have severe consequences for all further thought. This makes it clear how institutionalized production of signification becomes essential to the future generation of science, common sense knowledge, social strategy and agency.

13.3. Imagination

The philosophical thesis derived form this excursion into physical science, is that we observe what we are able to observe on behalf of our imaginative skills and the extent of our horizon[46], which form a prerequisite for observation – even when the objective and material paradigm underlies the excursion into the horizon of the imagination.

Brier presented a retrospective overview over the four major epistemological pathways taken in Western knowledge traditions. I have, with the empirical turn and in vivo research methods, suggested a forward directed path, based on creativity (Peat & Bohm, 1989). In this sense, if we take a starting point in the middle of the cybersemiotic star with a semiotic point of view, based on a retrospect understanding of the four epistemological highways, a new level of subjective imaginative skill that can, besides from integrating traditional academic objective methods as skills, adapt to the logic of abduction and intellectual musing, becomes essential. Because we are moving in a forward directed, anticipatory approach that is based on fallibilism and the necessity of intuitive hypothesis, the instrument of the imagination is necessary.

On the basis of our assimilation of central vocabularies, and thereby central theses, of the cybersemiotic theory, we can understand the imagination as a cognitive and conscious space for the exploration of potential constructive syntheses between phenosemiosic and thought semiosic processes that can incorporate internalized

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[46] Which, within the scheme of Gadamar, but also with endobiological evolution is stable, however, can be constantly developed and extended.

information that has not yet been intellectually ordered. What amplifies and structures observations at the social level, and what varies strongly from the preconditions of esoteric thought in Greek Antiquity, is: a different structure of collective consciousness connected to digital Information technologies, such as described by Roy Ascott (2005).

In Ascott's T*elematic Embrace*, it is not just so that one logical mind meets another logical mind in virtual space; the connotation of the term *embrace* means that qualia and phenosemiosis meet as well. This is the radical implication of the telematic embrace. The thesis is that as we connect through the symbol, we also connect through non-local phenomenology (perhaps based on properties of extended sentience), including qualia, in spite of geographical distance. The new levels of collective consciousness facilitated by digital technologies, then, become mediators of the interpretant relation between object and representamen, when it comes to understanding more of Nature and thriving upon information inherent in Nature. Digital technologies incorporate functional and structural aspects of human cognitive processes, and present platforms that bring individual minds together (one example could be the current formation of *the semantic net*) and build and assist processes of collective mind – most probably also our very realisation that there is such a thing as a virtual collective mind.

13.4. The ontological starting point
-On the levelling of physical densities

With extended sentience experience, observation and knowledge generation commences from a different level that what we are used to take into consideration. And properties that have been taken as oppositions, such as body and mind, or brain based emotion

versus embodied feeling, amounting to paradox, become not only complementary couples (Nicolescu: 2002; Kelsoe & Engstrøm, 2006), but overall holistic integrations. I would like to take this into account. It implies a return to a starting point in a material reality once again. However, now both human observer and reality are expanded and transformed. Observation is more than empirical and rational. It is more than a Kantian aesthetic judgment based on apriori categorisation. It is more than Hegelian synthesis. And the world has become technologically augmented. Because this is the case, I must not only operate with the concept of extended sentience together with my division of reality into five different categories. At the level of the materially real, I must define more than one level of physical density.

As we have seen in case study five, Milo Wolf's *Space Resonance Theory* moves further into deep ontology than Susskind's explanation of the physical Universe. This means, in principle, that all levels of physicality are connected at the level of scalar waves. Wolf's wave space medium demonstrates a level of order that exists prior to the pure quantum potential of Brier's phenosemiosis, Massumi's virtual reality, or Susskind's vacuum of virtual high frequency energetic entities, which is, however, ontologically in line with the theory of the enfolded order by Bohm. The main implication of both theories is that there is a level of order that is somewhat determinate of the seemingly chaotic behaviours of virtual and elementary particles at the quantum level. If it is so, this must imply that our physical bodies are also connected to the pre-atomic-, pre-space level of reality; and perhaps not only in indirect, reverse orders where fourth density spacetime takes ontological precedence over the quantum vacuum. Nicolescu (2002) claims that

our bodies are connected to the quantum realm, which, again, enlightens our extended view upon the theory of correspondence in truth. He does not, however, incorporate a level of virtual spherical waves such as that of Milo Wolf. And he, furthermore views the levels of reality as a hierarchy, so that the quantum level of reality encompasses the world of particles, however, not the other way around. He claims: 'In the sphere of levels of reality per se, that which is above is like that which is below, but that which is below is not like that which is above' (p. 52). We will incorporate Wolf's level of physical reality into our thought experiments, together with Nicolescu's hierarchical value of the levels. But let us now try to characterise our physical densities.

Nicolescu began the exploration into multiple levels of reality by referring to the three-dimensional physical reality based on classical physics, which we could call the third density. This is where Newtonian laws apply. Then we will refer to the four-dimensional spacetime reality, where Einstein's two theories of relativity, including theory of electromagnetic fields, apply. We can call this the fourth density. Nicolescu, however, made his main distinction between the local logic of classical physics with irreversible time, and the non-local logic of quantum physics, with probability instead of irreversible time. This is where we have quants and quarks that distribute a range of so-called counter intuitive behaviours (counter intuitive, because they do not follow the laws of either a third or a fourth density). Entering and accepting the so-called excluded middle that formed a logical paradox between the third fourth and fifth densities is what Nicolescu called to enter "the zone of non-resistance". In this scheme, there is not a contradiction between Einstein's relativity theory and quantum theory; they just

represent different levels of physical reality. The ability to operate with multiple realities, affect the deep logic of our ontological interpretations profoundly.

We can call the world of quants the fifth density. Generally, the quantum realm is viewed as pure chaotic and non-ordered potentiality, and this is where virtual particles come in and out of existence in accordance with our observations. Linear causality, thermodynamics, or even chaos theory and theory of dissipative structures cannot fully explain these behaviours.

Wolf's wave-space medium forms the entrance point to the sixth physical density. This is where we begin to understand a level of pre-space order, based on interference patterns between spherical waves; all of which would lie behind the electron, proton and neutron. It directs behaviours and events, which we then register as elementary particles in microscopes. Wolf does not deliver a full elaboration of spherical wave patterns, but declares that the most elementary pattern consists of an ingoing and an outgoing spherical wave, forming the electron. The idea of a fifth and sixth density behind the densities, which we have registered today, relates somewhat to Bohm's (1980) idea of enfolded and outfolded orders. To make an even deeper ontological frame, from which we can observe, we can exhibit a seventh density that would lie behind the sixth density level, and have yet another qualitative spacetime reality, which demands a zone of non-resistance to enter. We could also choose to view the zone of non-resistance through the metaphor of an interface between densities and

reality. Our seven density levels represent an arbitrary categorization and an intellectual frame from which it becomes possible to think out our problems.[47]

To couple our idea of physical densities with the idea of extended sentience and the observational potentials of the organism, with Oschman, Ho and Bradley, and their integration of quantum physics into biology and psychology, which is somewhat in accordance with the theories of Bohm and Wolf, we could assume that in the bodymind, there would be equivalences to all seven physical density levels. The theory of the physical densities, however, would not be adequate by itself to describe Brier's cybernetic and semiosic processes of the bodymind. Therefore, some processes, and parts of processes must be articulated through terminologies and references outside the realm of physical science. This is also a central thesis in the cybersemiotic theory. Since our general approach is semiotic, and starts from the middle of the cybersemiotic star, I will suggest that the wave-space medium of Wolf is understood to affect and operate as a partial effect in all material densities. There are signs of the wave space medium all over the third and fourth densities. However, not all of these signs can be met in empirical measurement, as of yet. This relation between the human subject, based in extended sentience, and our five density levels relates directly to the way we can understand the correspondence theory of truth.

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[47] Just like an artwork can make out a conceptual frame

When it comes to the implementation of densities into densities, we can say that at the sixth density of spherical wave patterns there is full connectivity, relative to the level of connectivity at the level of quants, and the full separation formed by macro scale matter, presented in the third density. Full connectivity illustrates what in philosophy of quantum mechanics, and at the level of the fifth density presents itself as non-locality and entanglement. The sixth density presents a spacetime realm that is non-equal to third or fourth density realms. Both density levels include spacetime. But spacetime would have to be different in different densities. At the level of the third density there is a higher level of partition and diversification than at the sixth density level. And in the third density realm there is full separation.

Categorizations in language often appear on the basis of correspondence (of the ego-subject, who is not based in extended sentience) with the third density (for instance in Lakoff and Johnson). This would, however, not be adequate in descriptions of the effects of fifth or sixth density on third density physicality. Although classical physics holds the material level apriori, and quantum philosophy holds the quantum level and consciousness apriori to the material level, I suggest that the respective densities be related in a non-hierarchical manner, at least when it comes to causality. Like Roy Bhaskar's (2008) three ontological domains, and our five levels of reality, density levels would by necessity be out of phase with each other when it comes to space and time. This means that the qualities of the sixth density are not causally a priori to complex structures or differentiations that appear in the third density; however, they also cannot be described fully by the features of the third density. So, we are back to a simultaneous

integration and separation of physical realms that affect our being and thinking, and relates our human subject with extended sentience to the physical world in ways that must be thought through before it can enlighten us of a possible new relation representing our correspondence theory of truth.

13.5. No effort communication

Jürgen Habermas' (2001) solution to optimal communication was the attempt to reach consensus at the level of discourse. With an understanding of consciousness connected to the fourth, fifth and sixth densities, and thereby to levels of reality that are mainly based on wave qualities, we could suggest a potential for communication lying in principles of resonance and synchronicity that makes itself explicit at levels deeper than discourse.

Marie D. Jones and Lary Flaxman (2009) have delivered a theory that builds on mechanical and sound based resonance. They characterise resonance as 'when the vibrations produced by one object align with those of another, ...' (p. 21) Thus, resonance, by its very function connects objects or people through resonant vibration, and the resonance frequency can mutually reinforce the vibration in both. In this sense, resonance causes amplification. The effect of resonance is typically known from physical objects, both in technologies, but also in nature. However, Jones and Flaxman points to research that tells us that humans are also affected by micro scale frequencies of sound and light. The scale of sound frequencies is, just like the scale of light frequencies, much broader than the scope of audible sound and visible light as taken in

by the ear and the eye, which represent but a minor part of the full spectrum. This means that our regular, non-amplified sensorium only detects and interprets small parts of the reality that surrounds us. Jones and Flaxman, however, point towards extra-sensory levels where the micro scale environment can, in fact, affect a person, for example at the level of infrasound. What is central for us here is the idea that communication can happen through the effect of resonance and synchronicity, based on different frequencies of sound. This thesis certainly provokes established theories concerning the human sensory realm. But what we want is to play with the potentials of such an idea. And we can ask further: what does that mean for social connections, and thereby for intersubjective communication?

This level of sound based resonance between people would precede Habermas' discursive consensus, because it is mainly connected to the fifth and sixth densities, and thereby to people's intuition rather than rational thought. But it would not contradict or eliminate it.

Detecting resonance and synchronicity between human subjects demands feeling over brain based cognition, as also suggested by Dr. Raymond Trevor Bradley (2006) in his psycho-physiological theory of intuition, which is based on a theory of light. Here Bradley suggests that there be quantum holographic effects in and between human minds. Bradley is part of a team that conduct research into the intelligence of the heart located at the California Institute of Heart Math. Both Bradley, and Jones and Flaxman are controversial in their suggestions; however, fit the scheme of Bohm, Ho, Oschman and Wolf, and also the indications of artworks such as *Blue Morph*, to a large

extent. They are thereby writing themselves into a controversial, but new, tradition that is, as of now, in conflict with established disciplines in the natural sciences, but nevertheless in growth.

If it is so that connection to intangible objects and social connections in general can happen at the level of the fifth or sixth density, which are the implications of Bradley's theory, then this could result in the potential of new degrees of accuracy when it comes to meaning making and truth, negotiated at the socio-cultural level. Bradley writes in a 2006 article:

> 'Often such intuitive foreknowledge involves perception of implicit information about non-local objects and/or events by the body's phychophysiological systems. Recent experiments have shown that intuitive perception of a future event is related to the degree of emotional significance of that event, and a new study shows that both the brain and the heart are involved in processing a pre-stimulus emotional response to the future event.' (p. 1)

We could suppose that, if this is true, there is a potential for higher degrees of accuracy in the communication between people, and a choice of individuals in the act of social networking, which could change the speed of human agency and communication within the system. This is so especially because intuition works at a much faster pace than intellectual reason, and is furthermore much more accurate. It is not typical, however, to

train these abilities, and they are not generally accepted as a part of the process of knowing in academic institutions.

To Bradley, navigating by the accuracy of intuition involves a focus upon the intelligence of the heart, apriori to that of the brain. This stems well with our concept of aesthetic reason, and Ho's emphasis on the heart.

In this context, the interesting level of human interaction is that which can best be described by metaphors from the electromagnetic spectrum. And thus, the underlying resonance and synchronicity in experience and knowledge, however in less concrete ways, would form the foundation for a conversation that could be on equal wavelength. If there were an equal wavelength, resonance and synchronicity in an intersubjective communicational exchange, there would be a high degree of instant adjustment and little resistance, with a re-enforcement of common intentional goals as a result. This is what I, poetically, will call the principle of *no effort*. It does not suggest that there is resonance and synchronicity between all at all times, but rather just indicates a potential. The social habits and patterns possible on this account would follow structures in Nature (secondness), just like the social autopoiesis of Luhmann, which was based on the functional pattern of the biological cell. However, it would be a different structure than that of autopoiesis, because properties of the fifth and sixth densities would never distribute equally in the third density. A dominance of no effort communication in social systems or sub-systems could change the pace of intersubjective communication, resulting in changes in social formations (such as, for instance, organizations or research clusters, connected to other research clusters, etc.), just like the concept of

cybernetics and networks have changed not only our perception of organisations, but also the very organisations proper. The level of communication explored here rests upon a focus upon effects of fifth and sixth physical density on the third density, and a reality that takes all the mentioned reality levels into account.

This is yet another theoretical place to locate our post-objective human subject. In order to be able to navigate by these functions, a new kind of human subject is needed. An individual cannot be driven by intentions based on a day conscious rationality, and be a confined, separated ego-identity or a black box, if she is to integrate her non-local properties and properties of entanglement with the surroundings. Furthermore, due to the tight connection between the quantum level and the day conscious mind, the person who navigates on behalf of resonance and synchronicity is a human subject, who has become used to navigating on behalf of extended sentience.

On this background we can begin to understand or view perspectives where it is possible to understand the relationship between individual, signification sphere, and common, socio-cultural clusters of agency in relation to the formation of knowledge cultures on a different basis.

13.7. The contemporary academic Now
- On time, presence and consciousness in academic work

By integrating the principles of non-local consciousness, hereunder the potential for anticipation through heart and brain-based feeling, the idea of knowledge as a process of retrospect rational intellectualization no longer suffices. One significant change,

which I treated in Part I, Chapter II is *The Epistemological Turn*, where not only engineering practice becomes knowledge generation in itself, but more the forward directedness in practice forms and in theoretical frameworks. From a higher meta level of retrospection, *I view theories and knowledge cultures of today to be formed in a much faster exchange between experience and retrospect analysis, and a forward directed, anticipatory creative approach than what has been seen before*. This is related to what I called *the speed of thought*.

13.8. Conclusion

In the spirit of the theme of this chapter, the relativity of time, space, cognition and consciousness with overall patterns of social signification could imply that there would be a range of evolutionary lines, when it comes to the overall formation of social knowledge cultures, and not necessarily that there is one overall line of progression tied to a certain discipline, culture, practice (such as science), or even an overall, all-encompassing telos of Nature that steers all processes. The idea of endobiological evolution does, however, imply an evolutionarily based extension of cognitive and conscious potential in the individual human bodymind over time, as viewed in relation to the species Homo Sapiens Sapiens, which changes perception, cognition and the way we relate and generate umwelts, which, again, affects the way signification spheres are generated.

It is only in the relative spacetime frame of the human life span (which colours the perception and memory of the human observer), and the mass of the physical substances

that surrounds us, that matter can seem consistent and perhaps even eternal, as the cosmos was for instance presented in common interpretations of Aristotle. Everything is in a constant state of becoming and declining, and is always on their way towards morphing into new shapes and behaviours, and new states of provisional equilibrium.[48] Seen from this point of view, using a time perspective is a way of measuring relative relations between two or more basic elements, and the consciousness of the human observer is always implicit, and never fully objective. The composition of constants and variables that we form, delivers the frame of text through which we arrange content in order to explore, and create further meaning and understandings, that, on the other hand, also always form our point of departure. Time can be viewed as a property of matter itself. But the finality of space and time, which is a prerequisite for the lines of causation, strategy of academic rhetoric and overall theories that we make, also mathematical such, is a contingent construct, whether the theories be of the Big Bang, the particle zoo, or of collective intersubjective social formations.

Time perception interpreted by the logical mind is thus a mental equation, and in this context we can understand the idea of an equation as an option for both mathematical language, but also for the logic and rhetoric of conceptual theories. In this sense we can say that the spacetime relation is one of the most basic algorithms that influence on academic rhetoric, and every central worldview dominating a particular system of thought. It is only that we don't notice, as long as we are, broadly, driven by static ontologies and a resistance to move into the depth of noetic realms, and, furthermore,

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[48] This relates well to Peirces three kinds of evolution and habits in nature, and to Nicolescu's multi-levelled reality.

resisting the discipline of philosophy to rest on a transdisciplinary epistemological basis that allows this modus operandi to explore all corners of the cybersemiotic star.

Chapter 11: The Life Cycles of Metaphor

14.0. Introduction

In this chapter, I will contemplate metaphors as a mental phenomenon that is part of how insights and concepts arise at the level of cultural semiosis, the day conscious mind, and our ability to name. I will suggest to view conceptual thinking by the aid of metaphor as a kind of cognitive scaffolding at the level of semiotic content in processes of signification in thought semiosis, which is formed on the basis of likeness. I expect it to form an effect in the meaning making processes that allows one domain to inform other domains, and to name objects from domains that move across scales such as micro- and macro, physical and non-physical, or, perhaps even fractal multiplicity. To view metaphor generation as a part of cognitive scaffolding also means that its use can have an effect that allows a cognitive mind (individual or inter-subjective) to hold increased levels of complexity, including navigation in different levels of reality. Here, it presents a potential for a condensation of former knowledge into a single concept through analogue reference, which results in the ability to express more with fewer symbols (where the term "more" includes both a vertical and a horizontal memory horizon). This property presents a constructive function, when knowledge and meaning accumulates at an evolutionary level of the signification sphere.

I will look into how particular metaphors influence upon academic theoretical thinking by carrying loaded meaning. And I will look at metaphors that I understand to bear anticipatory connotations. I will not, in an anthropological approach, study and

articulate how the actual process of transfer between name given individuals or communities might have happened. I will rather form a philosophical consideration on the nature of metaphor. The main interest concerns transactions between mind and language in oscillatory points that involve individual and collective simultaneously (but in diverse time scales), which happens through a line of distinction that I categorize as *bottom-up* and *top-down metaphor*. Another line of distinction concerns the question of how metaphors affect developments at the level of the ideally real, and from this point of departure become implemented at the level of the artefactually real. At the bottom line, the mentioned distinctions (bottom-up, top-down, ideally real and artefactually real) have to do with how we give causal explanations, and how we draw the time lines in cause and effect explanations (forward directed, backward directed, reversible and/or irreversible lines between densities and reality levels).

I will in this chapter limit myself to very specific metaphors that I regard as particularly loaded with meaning, and the point is not to treat the life cycle of a single metaphor, but rather to point out that metaphors have life cycles. The kind of metaphors that I have in mind, are terms that have had wide implications in academia, have transferred between multiple domains, and have been tested in art practice. They have thereby had an evident effect on knowledge cultures. They must, in fact, be understood to have directed processes of negotiation and meaning making in fields such as physics, biology, psychology, cognitive science, philosophy and parts of the social sciences. Viewed in accordance with the topics and theories treated in this project, terms like *homeostasis*, *energy, information*, *entropy*, *dissipative structures*, *emergence,* and *autopoiesis* are of

importance. We know the term "homeostasis" from the thermostat, but we also know it from theories in biology, concerning the function of the nervous system. Damasio uses the term as a reference to the balance of complex feeling. In this way, the basic functional meaning of the term has had important applicability beyond its source domain. Something similar goes for the laws of thermodynamics, and concepts such as "entropy" and "equilibrium". Even a biological theory such as that of autopoiesis, has evidently been inspired by cybernetics and thereby indirectly by computer science. Thus, many of these concepts have arisen from physical-material source domains, in particular new technologies, and are then used to signify abstract intangible domains such as the functional processes of a cell, an organism or a whole society. Other loaded terms from a technological source domain that have functioned as a central drive in the development of theory in several fields, and which are also central in this project, are the terms "network", "interface" and "virtuality".

A line of metaphors, which have, due to an ontology that integrates some implications of quantum philosophy, also played a central role in this thesis are metaphors from the domains of electromagnetics and quantum mechanics, which have become informative when coupled with new, deep ontologies, and placed in contexts outside of their source domain in physics and electronics. Metaphors from these domains have proven valuable as metaphors that could assist understandings of the biological domain (Ho, Oschman, Bischof), even if they can only provoke thought into partial explanations. They are terms such as: *electronics*, *wave, interference pattern*, *laser, holography*, *wavelength*, *resonance*, *frequency* and *synchronicity,* where the term and concept of *enlightenment* takes its own particular place*,* and which inheres a potential for both retrospective and anticipatory connotations, which I have discussed in

Part II, chapter four. Here, I pointed towards a possible mutual influence between the technological area of photonics, and the biological area of biophotonics that is like the mutual influence between computing and cybernetics and the cognitive sciences, which we have seen. Several of the metaphors that I have mentioned from the electromagnetic area have been used in the thesis as explanatory tools (case study four, and Part III, Chapter one, where *laser* and *holography* are used to describe possible bio-psychological processes involved in intuition).

However, in this particular chapter, I wish to contemplate how metaphors are mediating between source domains, thereby informing multiple areas, and pointing towards a level of similarity in frameworks that were otherwise alienated to each other. In this thesis, metaphors that relate primarily to the virtually real are taken seriously into account as significations of something real. This has to do with questions concerning how new information can be induced into the sensebody, and how the sensebody reacts by connecting a *feeling* that is generated by energetic induction to a particular signifying (cultural semiosis) concept, and which relates to extended sentience and Bradley's theory of a psycho-physiological explanation of intuition.

This could for example concern when the expression "being on wavelength" is used to describe the innate feeling of two people in sync, and where the symbol (being on wavelength) is supported by an inductive experience, and feeling of mutual connection. What makes the metaphor relevant, then, is not just a metaphorical function as part of a formal logical scheme, where signs are all viewed as arbitrary, but an actual inductive experience made through the sensebody. This inductive experience

will tell the user of the symbol that "being on wavelength" is not just a trope, but a correct, iconic reference to a felt experience. The same goes when the word "energy", the explanation of which is typically linked to physical science today, however, was originally an ideal reference (Aristotle's energia), is used to describe the quality of a pulsating flux of quality in the structure. And here, it is essential to emphasize how signs in one semiosic context (induction as feeling) would never be one to one with the self-same sign placed in another semiosic system (induction understood as a brain based cognitive function).

My further expectation is that, besides from informing across disciplines, metaphors can also come into collective mind at an intuitive level (and are inter-subjectively negotiated) in a process that lasts over historico-cultural time, where they, at a later stage of the collective experience of the phenomenon, end up being taken at face value. This means that from being a product of pure mental pondering, they reach a stage of concrete representation in the signification sphere. I have mentioned the transfer of knowledge from the ideally real to the artefactually real several times in the thesis already. This is because I view it as essential. One example could be how Freud (2010; 1961) used psychological and cultural explanations of how the sub-conscious repressed certain things (for instance sexuality) in dreams (the level of the ideally real dominates explanations), whereas neuroscientist and dream researcher J. Allan Hobson (2001) argues that the real explanation of the dream state is that the chemical balance in the brain has changed, and releases the free flux of images, memories and feelings from the judgmental function based on activity in the frontal lobes. This is how Hobson explains

Freud's (2010) concept of the super ego and the burden of culture. Hobson argues through what he understands to be empirical evidence (the level of the artefactually real dominates explanations). In these coincidences, it seems legitimate to ask, whether the nature of these assumptions could be understood to have come into mind, before they came into matter? Something similar goes for Jung's use of the concept "synchronicity", which concerns the meaningful match of seemingly non-causal events, and of which he wrote in the 1920'ies, and newer research into synchronicity as sound based events, which have a psycho-physiological side to them (Jones & Flaxman, 2009).

Furthermore, in our attempts to signify metaphor, and its effects on language and culture, we are implementing stages of collective mind that cross the boundaries of individuals, and, individual life spans. It crosses historical as well as disciplinary borders. But the experiential development seems to be somewhat shared. A cluster of subjects will thus have the experience, and they will distribute it by negotiation of meaning in the social systems. If it has substance and pragmatic usefulness, the signification of the experience will gain a noteworthy position in the overall meaning making processes over a relative time span. This inheres a claim on my part, which says that just like language and thought can present an individual level that is logical in and by itself, so can the social semantics of a signification sphere. Thus, the socio-communicative, autopoietic language games of Brier are more than the language games between individuals (Wittgenstein, 1965), and more than the autopoiesis of Luhmann (1984), because they distribute a higher level of collective semantics. Within this supra-subjective semantic system, it seems that certain truths will prevail, because they are

based on particularly loaded meaning that has evolutionary attributes. This would be so, because they refer to real dynamical objects. In this scheme, we do not view theories as arbitrary constructs, but rather as representamens of dynamical objects, which, if their reference to the dynamical object is strong, while, simultaneously, they have pragmatic use and fit the logic of the given signification sphere, can have a generative effect – causing mutations within the given system of thought. If we were to borrow a term from Latour's Actor-Network theory (2005), we could say that metaphors that function as loaded terms within such theoretical schemes could be viewed as central actants within the syntax of this social semantics. We can relate the constructiveness of this idea to Peirce's agapastic evolution.

14.1. A point of critique in Lakoff and Johnson's theory of metaphor

All though Lakoff and Johnson presented an important claim by insisting on metaphors as a primary way in which the cognitive mind works, their basic assumptions concerning source domains and levels of abstract thought are strongly connected to a three dimensional materialistic world view. In *Where Mathematics Comes From*, Lakoff, together with mathematician Rafael E. Nunez (2000) sought to explain the foundation of mathematics in embodied experience in three-dimensional space. We can say that they understand basic reality to imply a body that navigates in the third density only, and with no levels of extended sentience. As we know, ontological premises form potentials and limitations for possible explanations. Thus, metaphors are in general understood to be derived first and foremost from experiences in three-dimensional physical realms in Euclidian space, from where still higher degrees of abstraction can be formed. The virtually real, however, is non-existent in Lakoff and Johnson (1999),

Turner and Fauconnier (2002), Lakoff and Nunez (2000). Our position is actually based in a material reality; however, it is amplified by extended sentience, five levels of physical density and five levels of reality. This makes a radically different point of departure for forming conclusions, and also while trying to understand the influence of loaded terms, together with the creative potential of exploring the use of metaphors in philosophy, art and academic practice.

14.2. Metaphors based on the relation between the *Virtually Real* and the *Ideally Real*

I would like to suggest that metaphors could arise not only from being a physical, human body in a third density reality, but from being a physical body and an energetic structure immersed in a realm of dense and less dense energy, which involves a level of qualitative, dynamic information and a realm of a multi-levelled virtual reality. As I have mentioned in part III, chapter one, the virtually real would connect to the so-called wave-space medium of Milo Wolf, which again is directly connected through wave interference patterns, with electromagnetic fields, which are implied in the third and fourth densities. I do, however, believe that there would be more to say than to characterise the ontological background for the elementary particles (based on laws of quantum mechanics) and the particle world as mere waves, whether we extend our foundation with Bohm and Wolf, and accept a level of immeasurable spherical scalar waves or not. There are definitely forces behind the level of virtual waves, and, in a fallibilistic spirit, it seems appropriate to assume that Peirce's triadic sign has no fixed ontological starting point.

Quantum mechanics speaks, in mathematical language, of behaviour of elementary particles as viewed from a point of departure of atomic particles and a material world. However, that does not mean that the level of quants and virtual particles cannot be part of a dimension, which has a completely different nature than that of the particle world, however, interacts with it. Or interfaces with it. The particle zoo of mainstream physics then, could be understood not as *particles*, but as different kinds of *behaviours* that are registered as part of our umwelt as they interface with the third and fourth densities in a variety of specified contexts (mostly laboratory contexts). If elementary particles and quarks can be recognized in the research context of physical science at particularly cold temperatures this is no certainty that behaviours would prove the same if studied in biological living tissue at nano scales (which the study of *Blue Morph* did indicate). Thus, physical density dimensions interface, but hardly in a one to one logical relationship, and we must expect them to show up differently in organic and inorganic substance respectively.

Furthermore: we would have to expect that what happens in the realm of the interface is not equal to the density realm itself. Quants, understood as behaviours, would thus not be equal to their sixth density outspring, because they are measured on the premises of the material world. And just like the laws of the quantum world are not equal to those of the atomic world, a sixth density based on wave fronts must be expected to function differently than the premises that we observe at the quantum level. This also means that we cannot explain behaviours of physical creatures like ourselves by referring to enfolded wave fronts only, even if we think we have discovered yet another physical level behind that which we thought was the last frontier. What I am proposing in the project, however, is that it might add to the picture. So the laws of

interfacing would not be sufficient to tell the story of the nature of the wave-space medium or of third density materiality. The different levels and kinds of interfacing, on the other hand, are the very levels that we seek to identify in this project.

14.3. When philosophy becomes empirical science and social communication

In the above section, I sought to articulate a way in which metaphors, as a semiosic process could be understood to have life cycles. What do I mean by life cycles? I mean the way central terms have been derived from experiences in the material realm, have been formed as ideas of the ideally real, and which later connect more or less directly to findings at the level of the artefactually real. One example could be how aesthetic sensibility, which has primarily been part of a philosophical framework, is now sought explained by neuroscientific studies (Damasio; Singer; Christen & Changeux, 2005) because adequate instruments are available. Or, as a connection between an ideal capture of a virtual object, we could talk of Bergson's philosophical *time* and *duree,* and Ho's biophysical explanation of this concept (chapter 20, p. 317). Or, to view it from a different angle: we could view Maurice Merleau-Ponty's philosophical idea of embodied phenomenology (an ideal object), which now serves as ideal concepts in digital interface design (an artefactual object) (Kozel & Kofoed-Hansen, 2007). When virtual objects, captured at the level of the ideally real, become embedded into interface design, or are tested empirically with success, these objects have become knowledge that is embedded in the materially and artefactually real, rather than being real only in thought or language.

My point is that it makes a difference whether the idea of the two sides of a carbon dioxide molecule from molecule to pure vibration is experienced through embodied interaction in an interactive installation with Victoria Vesna's *Zero Point* as an example, or whether one gains access to this idea through theoretical knowledge and mathematical equations that have been derived as ideal knowledge of virtual objects, first and foremost. In case of Vesna's *Zero Point* installation, the user will have an intuitive embodied experience. And, the installation also becomes a sign that the metaphor of particle/wave has transferred domain over time. This observation relates to Don Ihde's post-phenomenology, where he points out how the idea of embodied experience moves from being a theoretical concept, to become a concept for interface design, and becomes embedded in the cultural communications (multimodal, digital installations or interactive screens) and extensions of our senses and cognitive apparatuses, which form central elements in our current signification spheres.

The life cycles of metaphors are related to ways in which we come to realizations as human knowers. This is essential in this part of the project, and by characterizing the phenomenon of a life cycle of metaphor in this ontological section; we would have a renewed background from which to understand Part II of the project. When suggesting the reader to read Part III of the project, and then move back to Part II, it is to encourage reading into depth. The idea of the life cycles of metaphors means that metaphors gain importance both in particular knowledge contexts, but also in particular historical times, which build upon where the culture, or the signification sphere is in it's developmental process in relation to the different levels of reality, and in particular in relation to the

creative potential at the level of the materially real and today the artefactually real. The last point is made because of the role technologies play today, and their increased influence in socio-cultural communications, because technologies are increasingly intelligent and gain partial agency when it comes to the further formation of social structures (Forbes-Pitts, 2011).

14.4. A new level of induction concerning knowledge generation

We are used to understand induction in relation to observation of an external world consisting of material objects and from which we draw categorical conclusions. When I write that metaphors can be formed by inductions into the level of the materially real, what I am focusing upon is how the intelligent bodymind can register effects that can be meaningfully interpreted and expressed in a symbolic form, which can contribute to knowledge per se. Not all metaphors, however, relate directly to the levels of the materially and/or artefactually real. They thus have to remain ideal philosophical objects, until they find material or artefactual equivalences. Because virtual objects are intangible, there is a need for a metaphorical language to describe them. This would happen, in the first instance, at the philosophical level. And it would, to some extend, relate to what Kant called a priori philosophy.

Metaphors generated mainly on behalf of inductions from the virtually real are what I call top-down metaphors. And the most essential part about top-down metaphors is that they are, in this context, understood as representamens of real objects. *God*, *soul* and *angel* could be examples of top-down metaphors, whereas the term *light* can be used

both as a top-down and bottom up metaphor. With this suggestion of a kind of induction based on body intelligence through feeling, I will end my contemplations of metaphor. We have thus not studied particular metaphors and their pathways from philosophy to science and the artefactually real as much as we have generated yet another expansion of our conception of what forms the prerequisites for being a human knower.

From here, I will move into new contemplations in a chapter dedicated to the theme of logos.

Chapter 12: Logos philosophy and virtual grids

15.0. Introduction

In this chapter, I will contemplate a so-called logos in Nature, which is the idea that Nature has an inbuilt logic that human beings can potentially perceive and understand cognitively. Since we have accepted knowledge to be fallible, and have situated the knowing human subject in Nature, which is always grander than any existing human knowing, and since we have inserted a virtual level of reality, it makes sense to question, just like we did in case study one, the relation between inner insight and non-material objects in Nature. However, in this chapter we are more interested in objects related to structure than to pure quality. The idea of structure could also be related both to secondness in Peirce's phaneroscopic ontology, and in mediated form to habit of nature (which is equal to natural law) in Peirce.

Were we to accept that there is indeed a relation between the human logical mind and logic in Nature, which philosophers such as Aristotle, Pythagoras, Descartes, and Peirce have all claimed, it could be expected that it would generate effects in the part of the world that humans can register, and that it would colour their perception, cognition and being. In some way this also leads to a further questioning of the hypothesis that knowing is perception – first and foremost. And this, again, relates to our question concerning how to understand the correspondence theory of truth in our context.

Today it is typically not accepted in academic research to ask of this relation, in forms other than such of historical analysis of the theories of former philosophers. Therefore, the possible relation between human and Nature, building on cognitive structure, and related to a contemporary socio-cultural context, is left academically unarticulated. The idea of logos in Nature has, just like the idea of a deeper essence (a virtual level) behind Nature's material objects, been dismissed. If, however, we find it reasonable to think that there is indeed such a connection, this will affect both existing knowledge and the future process of human knowing. If there is a potential to extract structures of Nature through cognitive endeavour alone, it will have to change how we look at originality, and how we currently set a demarcation line between actual philosophical insight and knowledge constituted through academic analytical methodologies.

15.1. Nature's logic

Let us start by a short look at the historical background concerning the idea of logos. The ancient Greeks were positive of the existence of logos, which was a property of nature that could be reached by the human mind. In later academic interpretations of Aristotle, logos were primarily connected to the study of language and rhetoric with an emphasis on socio-cultural exchange, rather than on the relationship between human and cosmos. The Stoics (Marcus Aurelius' *Meditations*, 170-180 AD) understood logos to be an active force that animates the universe. This was inspired by Heraclitus (500 BC), who saw logos as form, and as an expression of the dynamic, logical principle of organization in Nature. Humans can capture aspects of Nature's logos, because they are born out of it's inherent logic.

In this project I will, at an experimental basis, subscribe to the concept of logos, and suggest that a resonance from Natural logos in human expressions would be situated in the underlying structures of language, symbols, words and concepts (perhaps, at this level we connect, in part, to the central essence in the theses of Chomsky and Saussure respectively), which would then, in themselves, form a representamen of the logical object that exists at the level of the virtually real. Language, would, in principle, include all forms of cultural semiosis, including principles of rhetoric, formal logic (hereunder, argumentative logic), numerical systems, mathematics, geometry, and even the digital principle of binary oppositions as a basic systemic algorithm (0 and 1's), as systems of logic than can, through computational machines, generate new complex orders on the basis of existing logical orders. In this way, logos can also be expressed in the functional and structural aspects of technoetic art installations, even if they also present complex semiotic ambiguity at the level of the interface.

If thought and language can demonstrate an innate order of logic, which the topic of formal logic does demonstrate, then technoetic art installations could inhere references to an equal kind of logic, which is, however, more complex than that of traditional intellectual logic, because it combines logical structure with symbolic and iconic reference in a level of cultural semiosis, that also functions as representamens of virtual objects.

Technoetic installations are texts, and they inhere language that represents a different, newly evolved kind of cultural semiosis, which often presents condensed symbolic socio-cultural references that come to represent a higher-order level of

thinking. The inherent logic of thought as illustrated, in part, in the structures of language, which we are considering here, would not be equal to that of the semiology presented by Ferdinand de Saussure, who saw language as a dyadic, and thereby arbitrary system, which had it's own internal logic consisting of oppositions, but which did, however, not present a genuine reference between sign and real object (Saussure, 1986). Our considerations would also not be equal to the biologically based, inbuilt, language potential that Noam Chomsky (2002) has suggested. Chomsky presents the thesis that the capacity for language is an innate cognitive property that forms a natural, inborn trait of the human species. Chomsky, however, does not take qualitative aspects, metaphysical aspects and language structure in its property as a medium between human consciousness and Nature's consciousness, explicitly into account. Since this relation forms our point of interest in this chapter, we will have to understand these theories of language as relevant contributions that do not, however, offer a broader scheme in which to think out the possibility of logos in Nature and mind.

We have thus made clear that our approach differs from the basic theories of language suggested by Saussure and Chomsky, and it does so at the ontological level; because in this context we operate with an energetic, wave based foundation behind matter and thought, which can, perhaps, better be described by metaphors of electromagnetism (resonance), behind words and their semantics, and their ability to capture not only deeper qualitative meaning (icons at the level of the virtually real), but also structural principles (indexes at the level of the virtually real) that become represented as logical systems in human thought. With Peirce, we could say that it is secondness in Nature that

is distributed somehow in thought, and then mediated through language. The signification of a structure in Nature, again, can be manifested as form at the level of the artefactually real.

But, we could also speculate, on behalf of the theories of Oschman, Ho, and particularly Bradley, Jones and Flaxman, whether there could be a physical side to the experience of correspondence between a signified representation of a structure in Nature, and its actual dynamical object? Carrying it a little far out, however, still within a reasonable spectrum in accordance with our chosen theoretical pillars, we will have to ask if it makes sense to think that words and signifying representations in themselves are carriers of (quantum) energy, and thus represent a spectrum of our physical reality? In accordance with our five levels of reality, we can place thought and sign at the level of the sixth density, and expect it to connect to the below densities through complex processes of interfacing. As we know from Nicolescu, and although Nature seems to find out fine by herself, there would be no simple way for human minds to articulate the correspondence between the third and the fourth density (Nicolescu's reality levels). However, we can understand the connection so that through the zone of non-resistance, we can encompass both levels in a comprehensive state that lies beyond the exclusiveness of paradox. Because of the complexity and difference in physical densities, and the underlying in-direct connection and interaction, it seems reasonable to name the zone of non-resistance with a metaphor from our artefactual world: the "interface".

While contemplating the signifying value of cultural signification forms, Mathematics, as the abstract logical system that it represents, would then capture some higher logic and virtual objects such as aspects of natural laws (perhaps mechanical aspects of Peircean habits as dynamical objects[49]) with ways of precision that verbal language cannot accomplish. Mathematics connects to the structural, indexical reference, as I see it. It has an advantage over words that allows its transfer to the domain of the artefactually real in manners that imply a much higher degree of precision and accuracy. Thus it becomes a medium that delivers the possibility of exact measures, and secure transfer of information from one reality level to the other; at least to a certain extent. Verbal language, thus, cannot perform functional exactness in the transfer realm between the virtually and the artefactually real. It can, however, generate another kind of accuracy, when it comes to its reference of virtual dynamical objects, which is based on meaning, depth and quality.[50] My expectation is that today our bodyminds have developed physiologically and at general levels of internal semiosis. They would thus be able to produce umwelts and signification spheres differently than in the early renaissance, where Descartes (1596-1650) formed his methodology of reason, or in the 1800's, when Kant (1724-1804) formed his philosophy apriori categories, or even than mainstream instruments of logic today.

One important difference is that today, the development of higher logos would have to include principles of new technologies, artefacts and media, all adding to

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[49] The idea that mathematics corresponds directly to virtual objects is well in accordance with Plato's ontological realism concerning mathematics and geometrical forms (Plato, c. 427-347 BC/1998). Peirce, however, worked the ideal level into the real through his phaneroscopic phenomenology, and would therefore only agree to the extent that mathematics could be viewed as a signification of parts of natures habits (Peirce, 1923; Brier, 2008).

[50] By this I am referring to the correspondence theory of truth, here in particular correspondence of signified meaning or logic with the realm of virtual reality

the cultural, symbolic landscapes that are understood to, in part, mediate a higher logos. And talking about Logos 2:0 would imply that the formalities of classical logic, first and second order predicative logic that were derived at earlier historical times, today are becoming implemented as part of artificial intelligence design,[51] and speech recognition systems and likely computer based functions. Some basic patterns of logic are thus being automatized through computers; from there they augment our artefactual realities, which forms a point of departure of the post-phenomenological situation. If today, our cognitive, perceptual and logical capacity is changing, and is being altered further by the implementation of these technologies into our current societies, then this could be a sign that a new logos has entered our signification sphere, and that the logic of human thinking per se would have to move to logic 2:0. Perhaps this could be why there seems to be an increased interest in the extended logic of Peirce, where abduction becomes an integrated form of reason, together with induction and deduction (Brier, 2008).

15.2. Cosmological logos, religion and habit

The ability to capture logic of structures from the virtual realm could be one reason why religions have been formed. Because only in metaphorical, analogue, poetic and symbolic language could such structures be captured in times where there was not representation of these structures at the level of the artefactually real. While understanding knowing as perception, we would have to expect that some people have the talent of being particularly receptive to virtual structures, even such that represent a time span longer than the one generation in which such individuals live. So the relativity

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[51] Where first and second order predicative logic is part of Boolean algebra, of which digital algebra forms a special case

of time at both physical and social levels is a central problem also, when it comes to the truth principle of correspondence. What time frame does a given signification actually relate to? How, then, can we judge its truth value? Can true perceptions only be formed in retrospective versions? Or can truth percepts be anticipatory? We have, through the concept of syntropy and Peircean agapistic evolution suggested a complementary principle of an anticipatory perception of dynamical objects.

I find that Peirce allows us to move into a higher level of complexity and depth by adding the phaneroscopic ontology, where triadism continues in the third density with the sign networks produced by human beings. However, our insertion of structure in the sixth density might come in the way of a Peircean phaneroscopic triad at the ontological level, and we have not explicitly solved this problem. We could further ask, whether the relationship between human semiosic "logic" and the logic of natural habits would not be in constant change – again in relative spacetime?

In the concept of "the speed of thought, we have speculated that this is happening at the social scale, and that it is characteristic of our time. Habits, thus, could come in and out of formation in different time spans, and, perhaps, with different registered effects as they cross the interfaces of the respective physical densities. Therefore, the logic of Nature, represented in human thought and language cannot be a static formation. Peirce's process oriented dynamical philosophy showed awareness that habits might not be universally and eternally stable, but present a process of eternal development towards still finer crystallisation.

As suggested in the chapter on time and relativity, the collective viewpoint of human knowing is human centred. It is based on the life span of the individual, the generation, and the cultural histories that we develop as a common memory in the signification spheres, but most of all; it is based in physical ontologies. This means that the natural laws that we have discovered so far at a macro evolutionary stage might seem like constants to us, relative to human horizons. In reality, even today, something such as gravity could be dynamic and change quality and scope over time spans, so wide, that we cannot grasp it.[52] The important part here is not to point out that our knowledge is fallible. It is rather to suggest a relation between what becomes available as information for particular cultures of signification, and the state of the art of the collective cognitive and perceptive prerequisites for taking in this information; which brings us back to the human subject and why we argue for the importance of constant self-recognition.

Concretely, this means that if extended sentience follows the endobiological evolution, the signified representations of the universe must necessarily gradually, change their form. The cosmology suggested by Aristotle could relate to the potentials and limitations of his horizon as a subject philosopher, but also to the potentials and limitations of the average state of cognition within the social system of power in which his knowledge was applied. A similar situation could be characteristic of today, where we are lacking an account of the multidimensionality of our physical world in our general theories of the human subject and knower.

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[52] This idea is inspired by Moffat, 2008

15.3. Descartes and the potential of human ratio in the medieval age and the renaissance

It seems that every time a dominating collective mind reaches into a new logos through subjective insight, and inter-subjective negotiation, and then gradually orders and structures knowledge from this renewed basis, there tends to be an exclusive focus on that particular logos form, until its potentials have been thoroughly explored and tested. This, however, would not mean that other forms of logos in Nature are not present. It rather means that one logos form comes into domination because a broader majority of the dominating classes resonate with this logos form. It can be that other forms of logos are developed as cultural signification, however become pushed aside by those in power.

Looking back into Descartes' concept of ratio, and the historico-cultural impact of his introspective findings, where he explored and described a potential for ratio to discover higher logos phenomena through functions of the intellect, which Descartes presented in the act of hypothetical deduction and methodological suggestions (Decartes, 2008), we find an example of esoteric methodology, based on inner knowledge. Descartes' methodology was one that connected introspective activity with the reality of God. Descartes' form of deduction varied from Poppers theory of falsification, not only by difference in historical time, but also through the way deduction was used. Popper's normative methodology that emphasised hypothetical deduction, empirical testing and falsification instead of verification, took its point of departure in intra-institutional practice of the mid 1900's, and in anti-metaphysical thinking. As viewed within the context of this project, we could say that Descartes seemed to have rather examined a

level of precision that arose in the correspondence between objects of the virtually real, and structural functions of the ideally real (cognitive structures), where Popper continued in the materialistic track of the logical positivist, what reality concepts were concerned.

Taking upon ourselves the evolutionary perspective, including endobiological evolution, we could here speculate that the need for development of the brain activity of ratio at a historico-cultural time, or in the developmental space time span of a signification sphere, then, would, in line with the findings of case study one, represent an inert, biological and sub-consciously based unused cognitive potential. At the time of Descartes, there were much greater social discrepancies between scholarly and unscholarly minds than today, which, of course, affected and characterised the overall signification sphere. Furthermore, Descartes was in clear discrepancy with the religious dogmas of his time, by suggesting that man could find truth through speculation, rather than through reading the bible alone. This, of course, all coloured the way the cognitive potential could manifest and evolve the signification sphere at the time.

Since Descarte's theories have created an impact that has lasted over several centuries, however, and in a retrospective analysis, we could allow ourselves to assume that there would have been high levels of pragmatic truth in his findings: truth in the sense that there was real correspondence between Descarte's method and the cognitive abilities of a high number of individuals at the time, but actually more because it has come to represent a dynamic move in the evolution of social knowledge and social structures through the formation of the scientific institution (Brier, 2005). In this

sense, Descartes directions in his *Mediations on First Philosophy* and *A discourse on the Method* could be viewed as having been anticipatory, representing the potential of a telos in Nature. It could thereby be understood to have provoked an evolutionary potential already inherent in the signification sphere, in a cluster of existing individual minds. Through a realisation of this inborn potential, a further human individuation process could take place as part of the evolutionary path from stratified and hierarchical societies to differentiated societies, where a still higher percentage of the population could achieve insight and knowledge, and where the priesthood gradually lost its social power to the institution of science itself (Brier, 2005).

I have to emphasize here that this academically unorthodox perspective on knowledge could not be understood in any linear sense when it comes to evolution, or the evolution of consciousness in cultures at large. There would be more complexity involved in the evolutionary perspective, since we also operate with evolutionary potentials and a diversity of evolutionary timelines, and we cannot expect an equal pace and quality in the evolution of consciousness in for instance the West and the East, which have, traditionally, operated through opposing ontologies.[53]

So we have suggested that for the development of ratio and scientific method to represent a genuine potential at the time, there would have had to be an unused potential in the collective mind, which would imply an inherent, sub-conscious level of will, that existed outside of the day conscious mind, in individual and collective minds. This

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[53] The claim of opposite ontologies in the West and East is supported among others by Bohm (1980) and Brier (2008)

would, by its teleological nature, be anticipatory of the future. At the biological level we can see it as a syntropic aspect, part of the brains' need to strive towards activating its utmost potential. Descartes, as a front figure, became the spokesman of the practice of this developmental activity. But the potential and readiness for the actual development was already present. The time span that characterises this process has been long: hundreds of years of development. No single human being could have figured out the outcome at the time. The inherent telos of the situation transgressed the perspective of any single or collective mind. The process was supra-individual, and supra-historical. The inherent mechanism thus has a scope of both space-time dimensions and intersubjective dimensions, which by far exceeds that of human comprehension in the here and now of the situation, however is no less ordered because of that fact. For a while, then, the hidden order is out of sight, so to speak, even for the people involved. It is only in the retrospect, and after long lines of development at many socio-cultural stages that we become able to retrospectively intellectualize such processes.

This way of viewing historical development supersedes the implementation into linear, historical, noemic or externally focused explanation models, and builds upon introspection and the evolutionarily based development of cognition and consciousness that allows us to view ourselves as a species in the retrospect. Thus, as a species at phylogenetic levels, and as individuals at ontogenetic levels there would always be potential that is anticipatory of the future, as there is in the seed becoming a tree.[54] This does not necessarily imply a deterministic view upon teleological potentials of Nature, because of the complexity involved while taking into account the growing space of individual free will, and because of the level of semiotic freedom, which is also

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[54] Which was an example of teleology in nature by Aristotle

always inherent when it comes to human beings, and which seems to also be increasing with less rigidity in hierarchical social structures.

15.4. Logos and Aesthetic Reason

The thought exploration presented in this chapter concerns the relation between cosmological grids and human minds. It builds upon the assumption that yet undefined patterns of resonance between virtual structures in Nature and the cognitive properties of our bodyminds exist as a physical reality. In this scheme, the properties of cognition as understood by ideas of cognitive processes dominated by information science do not suffice. They present an arbitrary dyadic relation to the surrounding world, when it comes to properties of cognition and what we could call cognitive percepts – information intake from the surrounding world. We are thus asking for an actual equivalence between virtual structures and cognitive structures, perhaps based on certain patterns in neuron activity. The thesis is that once a grid is implemented through resonance patterns, and patterns of synchronicity between the respective virtual structure and the structures of neuron patterns, and a further resonance of feeling through the heart, it would, again, relate to the language patterns of the socio-cultural, auto-communicative language games presented in individual thought semiosis, the last of which represents a mediation between feeling and language. If a person is fit, as was Descartes, and as would be the generative philosopher of today (ideally), he can account for this by capturing insights that correspond with the structure in words and cultural symbolic at large (knowing as perception), and seek further negotiation among skilled peers of the theory that comes out of it in order to test its pragmatic truth value; either as

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part of a wider intertextual philosophical scheme, or, perhaps, in the materiality of a technoetic artwork.

This means that the virtual grids would be informative, and that they would present an inherent non-human kind of agency and intentionality with anticipatory qualities that rely on the evolutionary process implicit in any habit of Nature, representing in the biological structure the syntropic quality. I would not expect the level of brain connection in this case to be based on a hierarchical and topologically distinct understanding of macro scale physiological areas in the reptilian brain part, the amygdala, or the neo-cortex for that matter.[55] It would seem more likely, and in line with the bio-energetic premises involved in extended sentience and endobiological evolution, that, if based on the laws of the fifth and sixth densities, it would, first and foremost, relate to the global wave patterns, suggested by Stanislas Dehaene. Dehaene (2009) has suggested that there would be global brain wave patterns that function at the gamma wave level, and which order input and activity from brain cells in emergent patterns that represent a higher order than that of traditional macro scale physiological brain topology. We could suggest that the level of global brain wave patterns could have a potential to connect to the totality of the living matrix in non-local quantum exchange.

While Descartes seemed focused upon development of very particular, brain based cognitive properties, aesthetic reason based on extended sentience takes a much fully developed, fine tuned bodymind into use; as opposed to an evolution that

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[55] Susan Hart (Hart, 2011) has, distinctively, described the hierarchical topological strucure of the brain, which has, up until now, informed many interpretations of neuroscientific data, but which is, however, often viewed as outdated. Newer approaches research into the complex electromagnetic spectrum of a variety of frequencies involved in specific brain activities, where Stanislav Dehaene (Dehaene, 2009) forms an example.

primarily is focussed upon the development of functions in the neo-cortex. Here, cognition relies on both inter-molecular and quantum connectivity functions, based on the intermediacy between autopoiesis and semiosis, and across the borders of internal semiosic systems. In this line of thinking, the bodymind has a wider range of cognitive capacities than are usually thought of, which combine autopoietically based, information processing that work as pattern fitting, with a complex network of semiotic interpretants related directly to organic biology (and which would have to be deciphered by use of a biosemiotic vocabulary).

By using this kind of explanation, I have moved from a metaphysical to a physical and bio-energetic understanding in order to explain the intermediary relation between logos and the perceptive and cognitive qualities of the mindbody. I must underline, however, that my use of terms from physical and biophysical science is always metaphorical, as I will not claim that they can be fully explanatory of the connection between body and intangible levels of Nature's consciousness. They can, however, lead us into new types of explanation that can, from here, be further explored.

15.5. Conclusion

We have in this chapter explored possible implications of some of our bio-energetic and quantum philosophical theories, in combination with cybersemiotics, a Peircean ontology and an extension at the level of physicality into our five density levels; which is, perhaps not in full accordance with a Peircean ontology. We must here make clear that the thought experiments represented in the chapters of Part III proper take us to the

absolute limit of acceptable hypothesis. Yet, this is also the very aim of the chapters. In order to be able to explore such schemes of thought, which must here be understood to be both imprecise and to represent an infant stage of integration of quantum rationalities into our overall philosophical and transdisciplinary scheme, it is necessary to form preliminary articulations. Thereby, we have not indicated final truths, neither when it comes to third person or first person understandings of the human subject, nor in light of our proposition of an extended view upon the correspondence theory of truth.

What concerns the particular study of logos, reason, and the connection between the individual and virtual parts of Nature, the reason why it is important to emphasize the potential of access to logos in mediation between the virtually real and the ideally real is that the path of travelling the resources of inner knowledge through an esoteric understanding of logic in nature, can be understood as a basic pillar upon which a large amount of the philosophical knowledge that lies behind academic practice does rest. It is well known that Plato operated on esoteric backgrounds and sought logic on metaphysical terms. Pythagoras' occult school, together with his metaphysical explanations of mathematics and music are equally well known (Dampier, 1966). Aristotle, who was a student of Plato, did, explicitly, divide his works into esoteric and exoteric writings. We have in this chapter also discussed Descartes, who sought the logic that God made available to his logical mind. We can add to this scheme, the often overlooked close relation between the active development by Sir Isaac Newton of what he thought to be a more original and pure understanding of Christianity and the development of his natural philosophy; where only the last part has been implemented

into the traditional canon of philosophy of science. This topic has recently come to the fore by scholars such as historian Stephen D. Snobelen (2004). Furher from that, philosophers such as Kant and Hegel are well known in philosophy of science to have relied on God and spirituality as sources of insight. Another example is C.G. Jung, who is known to have used esoteric methods (Lachman, 2013). Einstein is also known to have formed his theory of relativity as pure speculation, while he did not work in an academic institution: the theory could only retrospectively be validated by empirical testing and intertextual coherence (Bohm, 1980). Another example is the work of the famous inventor Nicola Tesla (2011), who claimed to see virtual objects as clearly as were they physical objects, which he then transformed from virtual patterns to science, and into actual technologies. Relating to Peirce, we could suggest that it is pure mechanical necessity and the level of secondness and the restrictions that secondness places on firstness which would show in the mind as pure logic; however, to Peirce, this level of reality was but one out of several: not the only foundation upon which to build valid science, and he would, furthermore, not prioritise firstness and secondness as primary realities such as we have seen in Plato (Peirce, 1923).

In such a study, it becomes clearer that philosophy of science itself in no way resembles the process of scientific practice, and the rules and methodologies implied by current institutional demands on such practice. None of these philosophers could be understood to be scientists in the sense that we know scientists today. None of them have followed the contemporary domination of a so-called objectivity, or the anti-metaphysical demands that influence both the social and the natural sciences of today, in their

methodologies. With Peirce in mind, and his idea of a connection in the act of abduction between mind and Nature, and the fact that abduction is not logical in the sense that we understand logic today, it seems only fair to expect that most, or all, major works of philosophy that have contributed to the evolution of science, have been worked out in a bigger frame than that of institutional science, it has been connected to cosmology, "God", but most probably to the kinds of logic that the mind is able to absorb through the act of thinking as a generative philosopher. The problem is that the relation of major natural philosophers to the mystical and religious traditions is being suppressed in contemporary Western academia. The inborn talent and urge to muse introspectively, and to find truth (signified correspondence with real dynamical objects) in line with those in existing philosophy, is thus being downplayed in contemporary educational environments. What do we do, however, if young people and/or children possess such talents?

The possible acceptance of inner knowledge, here in the form of an understanding of logic in Nature, further generates a problem area that concerns how we can understand the originality of thought, when it comes to central philosophical conclusions made in original speculative research. Besides from the necessity of skill training and advancement in the use of verbal language, truths, as dynamical objects in Nature, can in principle be available to anybody. The level of ontological precision or depth in perception would not, in itself, be dependent on academic training, since this skill is not accepted as a genuine pathway to knowledge and is therefore not trained in academic institutions. When it comes to the philosophical capture of dynamical objects, academia

today, thus, would represent no assurance of presenting the highest level of truth and the genuine potential present within the system represented by those who are in their learning process, and the weight that is placed on the originality of a thesis in this direction, is therefore highly questionable.

The idea of logos should colour and form a background of understanding that can be added to the approach that I have chosen to make to technoetic artworks at large. The way I interpret symbolic signs and their virtual dynamical objects is based on the idea that they are referring to real objects, where structures are often represented by central functions of the installations, and that these functions, while the artwork represents a high degree of aesthetic reason, can be directly related to a higher logos. Thus, the artworks, further than showing correspondence with central transformations in contemporary society, are understood to also correspond with particular virtual structures that we can understand as dynamical objects, which the artists try to translate into material form.

16. Thesis Conclusion

The project has delivered a patchwork of texts (within the overall text), each presenting a unique syntax of combined art reading, theory, and abductive speculation that deliver new ways of conceptualising the human subject. Because the project reverses basic materialistic ontologies, described in the methodology chapter, which, again, connect to basic lines of causation, complementary pairs rather than mutually exclusive oppositions, and to the connotations of loaded terms, its meaning and structure can be a challenge for the reader to grasp. Once we have fully accepted fallibility of knowledge as signification, five reality levels, a dynamic and process based thinking, meaning and understanding over production of facts, and the acceptance of an unclear demarcation line between subject and object, and between subjective and collective consciousness, the inbuilt causalities and textual order can begin to appear. The reason for the changed conditions is forced by the very nature of the topic: to integrate into a subjectivity study the study of consciousness while taking central quantum philosophy and new cultural communication forms (multimodal installations) into account. We have, however, not made quantum reality level dominating, but rather integrated it as a part of an otherwise multi-levelled materialistic reality; thereby we have reached a material reality of a new potency.

The new meaning produced in this thesis very primarily builds upon the concept of extended sentience, and how the consequence of taking this concept seriously implies a relationship between subject, object and intersubjective levels that integrates virtual levels, and something such as a collective virtual consciousness. A viewpoint that can

integrate all these positions has wide implications. It is especially the virtual densities (fifth, sixth and seventh densities), their connection to the body's energy matrix, and the inherent potential of the body matrix for non-local communication that relates the individual to the virtually real, problematizes and extends from the idea of separateness and the idea of the human subject being either an ego-subject, or with cybernetics, confined as a "black box".[56]

It is also an ontology of five non-hierarchical density levels, and five non-hierarchical reality levels that changes our ontological point of departure profoundly. While a three dimensional materialistic ontology and the positivistic inheritance would naturally ban the transcendental first person observer and knower, our, more complex ontology supports an understanding of the knower being connected not only to physical reality in an objective sense, but also to virtual reality realms, through a bodily sensorium, and extended cognitive properties, which can afford the complementarity of both materialistic exactness and philosophical transcendence.

Within the speculative suggestion of the seven densities, quantum fields of pure potentiality and wave formations emerging at the pre-quantum field level (Wolf) are also considered part of the physical realm. In that sense, Part III of the project has made a transformative impact on how we can understand art communication. But it also impacts how we can understand the third and first person human subject, hereby the generative philosopher and the material world in which she is embedded. The

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[56] The human subject as a "black box" is used both in traditional cybernetics, as well as in Luhmann's social systems theory, and even in Brier's cybersemiotic model. Thus, none of these theories incorporate non-local energetic mutual influences between people, or between human subject and Nature.

generative philosopher can sense and capture dynamical objects of pure structure, as well as quantum level information through her sensuous and cognitive apparatus, which is, besides from being rational and empathetic, highly intuitive. While philosophers such as Kant and Husserl were not able to explain the human capacity to transcend subjective macro level material confinements by reference to empirical research, only philosophical explanations could be given. This project, however, suggests that some properties of the transcendental philosopher be explained by bio-energetic theories, and that the transcendental state can reach into the extended sensuous apparatus, as well as into the less dense physical levels of material reality. Hereby, to seek new intangible objects by verbal formulation becomes an actuality and a genuine goal for the contemporary philosopher: we need to become gradually acquainted with those inner functions at work in synthesis with existing academic experience.

One implication of the endobiological evolution is that phenosemiosis becomes part of a process of sub-conscious verbalization processes in the day conscious mind, however, also that the functions of the biological body at the energetic level shift. Thus, the direct implication of the ends made in Part II, Chapter III is that extended sentience might reside as a non-developed potential in a large amount of people, on equal terms as this thesis has argued in favor of the presence of a potential of the rational mind in the time of Descartes (and onwards). To develop a clear inner connection based on extended sentience demands of the research subject to be highly attentive towards her inner processes of pre-conscious thought semiosis, and towards the flux of non-ordered thought, more than merely being attentive to intellectual and intentionally directed,

logically based, thought practices based on intertextual navigation. This, again, underlines the importance of the explicitly present generative philosopher.

An acceptance of such deeper levels of thought that bring us into contact with Nature at levels other than such of physical science or existing philosophy, re-establishes classical philosophical strategies, however, inserts them in a transformed cultural setting that integrates technologies of augmented and mixed reality environments – a more evolved and detailed signification sphere.

The ideal user that has been established while reading artworks, has functioned as a methodological tool, which has allowed me, the research subject and generative philosopher, to intellectually partition myself from the user of technoetic art installations, while simultaneously thriving upon subjective experiences with the self-same artworks. It is obvious that there can be no clear-cut distinction between ideal user and research subject, and that that becomes a statement in itself: the generative philosopher and research subject can take many varied positions. The experimentation with more than one subjective position in one and the same thesis forms a central function and statement that enlightens the answer to our research question further.

The treatment of the aesthetic experience in case study two led me to the conclusion that, if technoetic arts function as expressions of new knowledge, aesthetic reason becomes an important tool in the process of human knowing. Aesthetic reason represents a higher-order structure than rational reason, because it builds particularly on sense integration, integration of energetic events that concern the whole body with

cognitive properties into a intuitive notion of "truth", the sign of which is a bodily feeling. The change in the hierarchical evaluation of biologically embedded sub-conscious intelligence versus day conscious intelligence, where micro scales are no longer understood to be sub-ordinate to macro scale functions (at least at the energetic level) forms an ontological provocation that can change the causality lines within which we generate explanations more fundamentally than we might realise at this point. This realization is necessary, however, if is it really so that sub-conscious processes take precedence over day conscious properties, and are, by nature, also richer in information than the day conscious, interpreted versions of such.

To realise this twist in our self-understanding as academic knowers, is also central in order to allow ourselves to generate skills where we can cooperate better with sub-conscious levels of intelligence and consciousness that work on terms that we do not decide ourselves, however, that do direct individual and collective behavioural patterns.

Thomas Kuhn pulled off the curtain of the sub-conscious ontologies behind institutional practice in the 1960'ies. The paradigm shift that I am writing of in this project seems much wider than just a shift in institutional thinking. If there is any kind of truth to the thesis of the endobiological evolution, and in particular the accelerated pace of mind in individuals and collective signification spheres, then it is most probable that we will see researchers carry out research processes on a basis that is more fit with extended sentience and with properties of the ideal user, where ease in communication is attained

in the research network by resonance and synchronicity, and where complexities and ambiguities must be acknowledged through aesthetic reason.

Another aim of the project has been to demonstrate how technoetic arts could be viewed as contributions to the process of knowledge generation, based on principles other than those that are considered strictly scientific, however, without dismissing science and the value of scholarly insight and skill. The consideration of art as knowledge is an institutional development that is very real today.[57] If, however, it is indeed so that extended sentience and aesthetic reason become increasingly dominant properties of the human mind, ways of teaching, learning, and the role of the logical mind must come into question.[58] This is particularly so, when it comes to general understandings of intelligence, and the role that such concepts play in educational systems, in business recruitment, and in political social strategies. In this arena, an overall artistic approach to knowledge could become of increased importance.

16.1. The imagination: eye vision or extended sentience?

As extended sentience, which involves a level of synesthesia at an emergent level above that of Gibson's perceptual systems, and which relates to wave consciousness, takes precedence over visual studies, it becomes blurry how to understand the imageries of the imagination. With Oschman, Bischof and Bradley, I have suggested that the

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[57] An illustrating example is Symbiotica Lab at the University of Western Australia that combines art practice with research within fields of the natural sciences. But multiple institution based art-science collaborations emerge at a frequent basis.

[58] The idea that art and asthetic forms of reason are important, and will necessarily change educational systems is shared with Nicolescu, 2002

imagination has a level that functions more strictly on bio-energetic terms, which is, nevertheless, a kind of imagery that is based on principles of holography. In order for this level to be understood at the level of language games, this bio-energetic level of holographic information has to be translated into cultural images. This idea connects to the idea of top-down metaphor, presented in *The Life Cycles of Metaphor*, in Part III. This way of being in contact with one's body in the process of knowing is untraditional, both in ancient spiritual cultures, which did not have signification spheres that were in any way similar to those of contemporary Western signification spheres, and to current scientific cultures, which generally do not accept quantum based biology and explanations of consciousness based on quantum philosophy.

16.3. The Sense of Being moved
-Feeling is anticipatory of the future

We have defined a concept of feeling, which is loaded with potential information, and which, by its nature of reaching into a higher density through wave consciousness, can therefore be anticipatory and promote syntropy in the organism. Feeling, then, represents a high degree of intelligence, which, if we regard nano- and micro levels to be of equal value to macro levels, could be understood to exceed the intelligence of the logical day conscious mind by far. As we have seen, there are two major consequences of this insight. One refers to the idea of information excess within the bodymind (not just in cultural semiotics). In our handling of this state of mind, we can refer to popular spiritual and psychological literature, which claims the importance of "being in the now" (Tolle, 1997). The theory of the importance of being in the now has gained a widespread popularity in Europe and USA, where many people find resonance in

developing mental skills that allow them to "be in the now" and to integrate skills of meditation in their daily lives. The importance in Tolle's message, and its widespread resonance, can be viewed as a sign that a large group of people are experiencing altered states of consciousness, which are based on an increase in information, not only outwardly and culturally, but also inwardly and biologically. This brings with it a need for refinement and bettering of the processes of internal semiosis. Being in the now allows a focus on the present moment, where one needs to develop skills in order to sort out the complexities and overload of information, which would not be a similar problem in a structure that does not take increased amounts of information in (increase in ADHD diagnoses could be a sign of human beings generally taking more and more information in in the bodily structure; a condition which is, however, misinterpreted by the authorities involved). Because there is a level of evolution involved in phenosemiosis, which, in part, relates to the properties of the living matrix, the brain has to "process" much more information, or have higher semiosic tasks to carry out, which is why *the moment supersedes memory*. This could also be a reason why the heart is gaining an increased focus in questions of consciousness: in order for the body to process increased amounts of information, which leaves the brain based cognitive mind inadequate, the functions of the refined neuron networks of the heart must take over (the heart has a much higher number of neurons than the brain). In the theory of the necessity of experiencing the now, we can talk about attention in a shorter time span than attention to memory; where traditional understandings of memory would rely on a linear, narrative structure that creates cause and effect relations over a longer period of time. When talking of the now, we must make clear to ourselves that we are not talking about long and short-term memory: while referring to the biological equivalences of

consciousness, we are focussing on even shorter time spans, which can best be explained by Ho's multiple biological spacetime scales (quantum jazz), which produce experience at a constant rate. And my contribution is the claim that evolution causes us to become increasingly aware of this level of consciousness: phenomenologically and theoretically. The level of wave interference, and the "feeling" that can be registered and interpreted from here, can be informative in ways that punctuate the division between past, present and future. These timelines all co-exist as potentialities and information that can make an actual difference in the system (of the embodied, human subject).

In which way, then, can a feeling be informative of the future? It cannot tell concrete details. However, the experience and insight concerned with how one navigates on behalf of information given by feeling, can function as a background upon which interpretations can be made. In new situations, then, as for instance concerning the chock of the new when meeting an original art installation, the immediacy of feeling might be informative way past the moment of present concrete being, context and action as interpreted by the day conscious mind residing in the macrophysical world scale.

16.4. The integrative approach as a methodology

Since the project establishes its scope by integrating elements from a diversity of disciplines, and with the acceptance of paradigms that are not, currently, dominating scientific practice, and creates an overall syntax on behalf of a meta-level, extra-scientific, transdisciplinary perspective that does, however, rest upon firm insight from existing science and philosophy, it is obvious that if central aspects of one of the

paradigms used changes drastically in the nearby future, this will affect the overall argumentation that the thesis does represent; since paradigms form pillars of the overall framework. I will claim, however, that this problem is unavoidable, and that the major role of generative philosophy is to present meta-level integrative frameworks in which new thoughts can be developed, tested and further negotiated. All disciplines are constantly evolving, which is why references to neuroscience, to take an example, are very general and simple. The most central disciplines that have been used as main pillars in this thesis, is cybersemiotics, biosemiotics, Oschman and Ho's holistic biophysics, Bischof interpretation of biophysical theory of biophotons, Ascott's concept of technoetic arts, Ihde's postphenomenology in cooperation with Longo's epistemological turn, and, none the least, Wolf's space resonance theory. All of these theories, as we have seen in particular in the speculative thought experiments, have wide implications of how we can understand the knowing human subject, at both first and third person levels. This is the reason why their implications have been extrapolated into the representation of thought experiments in Part III. The thorough considerations of these implications through thought experiments, furthermore present the active generative thought processes of our generative philosopher. Demonstrating the first person philosopher this explicitly is not, however, the same as indicating final truth to the argumentations presented. As follows from the semiotic point of view, all we can do is to generate significations. If they can have a pragmatic value, in this case by causing further negotiation and thought provocation in existing knowledge systems, they are successful. But final truth cannot be achieved, and in this respect, the generative philosopher is a humble creative player of thought; even if she has established feeling, which directs her to idiosyncratic aspects of truth.

In Brier, it is only in the light of a Shannon-Wiener concept of information that the critique presented in the framework gains its true value. Once we have accepted that information cannot just be statistical pattern fitting, however, and we become willing to play with the possible meanings of the concept, Brier's main argument becomes problematic. Therefore, it is my opinion that Brier's substantial thesis should not discourage the general use of terms such as information processing, which are not only valuable, but also necessary at the current state of academic meaning making. In a further critique of Brier, we could say that if neuroscience shows crucial findings that move in completely new directions, which he has not taken properly into account, or if other approaches, such as for instance Don Ihde's post-phenomenology present substantial alternatives, which break with one or several of the paradigmatic pillars that build up the framework, Brier's overall framework will also be affected; because it is consistent with the basics of the paradigms that it nits together. The same goes for my thesis. However, as mentioned in part I, chapter 5, the goal is not to suggest a final solution. It is rather to suggest the work form of "transdisciplinary design", in theoretical research also. It presents a paradigm that can give writing directions, when working with generative philosophy in our time.

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Directorate-General for Research
Information and Communication Unit
B-1049 Brussels
Fax : (32-2) 29-58220
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APPENDIX 1

Glossary

Aesthetic Reason: where Aristotle's concepts "nus" (reason) and "aisthesis" (sensation) are combined, and a new level of reason that integrates bio-energetic levels of the body are all integrated into a new emergent concept. Aesthetic reason connects the macro level of physical organs such as heart and brain, where heart neurons begin to take precedence over brain neurons as according to the studies at the California Institute of Heart Math[59] and the book chapter of Cristina Miranda de Almeida, concerning the central role of the heart.[60] It also implies an ability to connect complex and ambiguous signs from syntheses that rely on an integration of biosemiotic, bio-energetic and intellectual levels, which can be registered through a central embodied and specified kind of *feeling* before a potential intellectual analysis is made.

Agapastic evolution: A concept used by Peirce to refer to evolution by creative love (Peirce, 1923)

Anancastic evolution: A concept used by Peirce to refer to evolution by mechanical necessity (Peirce, 1923).

Biosemiotics: A newer paradigm within the field of biology and biochemistry, originally suggested by Thomas Sebeok (1976; 1989), who, on the basis of the philosophy of Charles Sanders Peirce, suggested that central biological processes could be viewed as semiotic, rather than mechanical. The field is growing, however not widely accepted within mainstream biology. Central contributors today are Jesper Hoffmeyer, Howard Patee, Kalevi Kull.

Correspondence theory of truth: The correspondence theory of truth represents the idea that truth can be found in a relation where the observed is equal to the observers experience of it. A mutual connection between thought, language and the object in question is expected. This truth principle has been discussed philosophically from Aristotle and onwards. With Postmodernism, poststructuralism and social constructivism the concept of truth was placed into doubt, and since then it has been somewhat of a taboo for an academic to claim the existence of truth. The philosophy of Auguste Comte (Comte,1988) was aimed to discourage metaphysical conceptions of the correspondence between observer and observed, while establishing a view upon reality that was strictly material with measurable objects, since he viewed theological and metaphysical explanations as more primitive than those of positive science. In this project we question the positivistic version of the correspondence theory of truth against an Aristotelian approach, the last of which is embedded in a metaphysical understanding of reality; however, we are also questioning the very foundation upon which to judge that something is meta-physical (extra-physical).

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[59] http://www.heartmath.org

[60] De Kerckhove, Derrick & Miranda de Almeida, Cristina (editors) (2014) The Point of Being, Cambridge Scholars Publishers, U.K, chapter VIII, pp. 219 – 311.

Consistency: A concept of truth that relies on logical consistency in argumentation (Brier, 2005). Consistency can be represented by the inner structure of logical argumentation in an academic argument so that basic premises and conclusions are both valid and true, and connect logically to each other. It would, by nature, differ, exactly how consistency in argumentation is accounted for in paradigms that primarily emphasize meaning or factual truth respectively. The logic of meaning, as we have seen with the cybersemiotic paradigm, might differ considerably from the logic of fact.

Cultural semiosis: Signs that are produced at the cultural level by humans, as opposed to biosemiosis, which is based on biological processes, and are not consciously produced by human beings.

Cybersemiotics: Søren Brier's concept, relying on a transdisciplinary integration between central ideas from second order cybernetics and semiotics, including autopoiesis theory, Luhmann's social systems theory, and Wittgenstein's late theory of language games. The most basic ontology is represented by a Peircean phaneroscopic phenomenology (Brier, 2008).

Day consciousness: The part of consciousness that is self-aware, and can intellectually observe itself. Using this concept automatically indicates that there is a large part of human consciousness, of which we are not self-aware; both in dream states, but also in consciously awake states. In general, consciousness is understood to operate, in part, on the basis of final cause; just like biosemiotic processes are expected to involve an element of final cause (Hoffmeyer, 2008a; Brier, 2008). Day consciousness is understood to deliver but a fraction of the consciousness that works in the overall mind and body structure. Day consciousness is a concept that I, the research subject, have produced and defined in order to make a clear demarcation between a particular kind of brain-based self-awareness and the many sub-conscious kinds of awareness represented in this project (in part by molecular biosemiosis and quantum level bio-energetic action).

Day conscious experience: The level of experience that is, or potentially is, available to our day conscious minds, which exists by itself and involves a constant flux of information exchange, internally and externally, and which we can enter through an internal focus by functions of the intellect. It is hereby indicated that intellectual activity, such as academic analytical practice, represents but a fraction of the capacity of human consciousness, and therefore also of human potential knowing. Since the sub-conscious levels of mind, including functions of the biological body, constantly gather, sort out, store and clear high levels of information, intellectual analysis must be viewed as subtractive. Theorists that emphasize the extensiveness of the sub-conscious as opposed to the intellectual mind are, among many, Antonio Damasio, James Oschman, Brian Massumi, and Brier to the extent that he emphasizes phenosemiosis as pre-intellectual, pre-linguistic experience, together with language games, which are understood to inhere mechanisms that, to some extend, reign outside of the will of the individual.

Digital virtuality: Virtual information that can be accessed through electronic and digital interfaces, which, in this project, is viewed as part of the artefactually real, and

does not represent a reality realm by itself.

Ego-subject: The term "ego subject" has deep connotations to the theory of psychoanalysis by Sigmund Freud, and his ego-theory (which was further developed by Anna Freud, Heinz Hartmann, David Rapaport, et. al.). It further connotes the more recent idea of second order cybernetics, where the individual is viewed as a "black box". The black box theory emphasizes separateness between individuals, when it comes to questions of consciousness. The ego subject, in our context, is basically the human subject, understood as a confined entity, whose purpose in life is stripped of spiritual dimensions. It is furthermore an entity that strives for his or her own benefit, to satisfy personal needs, first and foremost, and who therefore is in competition with his surroundings. We find this idea of a human subject in economic theories (homo economicus), but also in theories of biological evolution (Dawkins 1989). The ego-subject furthermore is in control of his surroundings by having full information. He is run by the rational day conscious mind (ego), where emotions are understood to be sub-conscious (id), and where society places moral and normative strings on the individual that suppresses these unconscious emotions, experiences and desires (superego). In the academic thesis an ego-structure becomes apparent as an implicit writer, in part, by demonstrating intertextual competition through critical argumentation, by supposed separation from himself and others, and between himself and what he observes (objectivity). In this scheme, thought is by no means collective, and the strife for truth is often colored by subjective goals, such as career, earnings, and academic position within the competitive landscape. This approach affects academic intertextual syntax in the way that each central contributor defines himself in opposition to other central contributors, and therefore the syntax builds on mutual exclusivity in authorships and concerning central topics, and even terms in question (understood as according to binary oppositions rather than complementary pairs (Kelsoe & Engstrøm, 2006)).

It is a claim in the project that rhetorical strategies and strategies of critical argumentation are, to a large degree, demonstrating an implicit writer, who is an ego subject, and that the transcendent, connective, non-separated human subject, who implements transdisciplinary strategies, based on multiple levels of reality (Nicolescu, 2002) as part of the academic thesis will, over time, generate a different intertextual syntax that has more potential when it comes to the necessity of reducing the complexity of information excess in the academic system (too many productions presenting only slight variations in the topics treated), especially what concerns contemporary and future human sciences and philosophy as a discipline.

Endosemiosis: A biosemiotic concept that relates to biological semiosic processes, which happen primarily internal to the organism (Üexkull, 2010).

Episteme: Plato and Aristotle originally used the term to explain the experience of knowledge. Foucault, later on, gave the term new connotations by placing it in a cultural context relating to his own post-structuralist and postmodern schemes of discourse and power (Foucault, 2002). In this sense, the concept of episteme became concretized and related to society, rather than being an overall and widely abstract concept as in Plato and Aristotle. At the same time, Foucault's "epistemes" lead us to realize how academically derived knowledge, theories and vocabularies gain cultural influence and penetrate minds more generally than just presenting academic practice. Lars Qvortrup

(Qvortrup, 2003) uses Foucault's concept to point towards a certain epistemic "semantic" at the social level, in which theoretical discourses become central in people's experience, and, to use concepts from Jürgen Habermas (which is of course in no accordance with either Luhmann or Qvortrup), penetrates lifeworld and system simultaneously. This semantic is also a basic part of the power mechanisms of inclusion and exclusion, when it comes to the discourses, and their underlying paradigms and ontologies, which have been accepted. In this sense, epistemes become part of a general collective horizon. This level is, to Foucault, a sub-conscious level, just like Kuhn's "scientific matrix" was understood to be sub-conscious to practitioners of the natural sciences in the 1960'ies. And it is at this level that we must operate, in order to begin to open up to the potential of new epistemes and a new semantics.

Exosemiosis: A concept form biosemiotics, referring to processes of sign making where the organism communicates with levels external to itself, mainly by input into the structure, such as nutrition or sensuous input. (Hoffmeyer, 2008a; Brier, 2008)

Extended Sentience: Extended Sentience relies on a broadened sensuous apparatus that integrates cognitive operations as part of being a sensuous creature. It not only integrates biosemiotic levels of endosemiosis, but also the bio-energetic properties of Oschman (2005). Reason based on Extended Sentience is different from brain-based reason, where emotions are either repressed (Freud, 1961; 2010), or function as a background for intellectual decision (Damasio, 1999), but nevertheless are regarded as inferior to brain based reason. Extended sentience, however, is superior to brain based reason, in part because it is faster. It connects closely to what we typically understand as "intuition" (Bradley, 2006), however it involves the full bodily structure in integrated wholes that constantly shift sensitively in accordance with inputs given from the external world. It is therefore in more accordance with what Massumi calls "affects" (Massumi, 2005) than with Damasio's concept of "emotion", and it does represent a kind of consciousness. A central positioning in extended sentience results in an extremely sensitive, yet highly informed, human subject, in opposition to the ego-subject, who suppresses feelings, but is not related to the full-body sensorium of extended sentience. The research subject has coined this term.

Human Subject: The human subject is questioned at a deep ontological and philosophical level that relates to philosophy, and to philosophy of science, and is part of an extra-institutional meta-discourse as opposed to academic practice. This pre-scientific and speculative level of deep ontology implies that the project does not incorporate or relate to subjectivity theory that is understood primarily as academic practice, and which involves only weak degrees of transdisciplinarity, and effort to question and establish new borders between subject-object, and between subject-intersubjective levels, and to integrate the effects of the symbiosis between new technologies and individual.

Ideal User: The ideal user forms a yet unarticulated user, who emerges as a response to the affordances and symbolics (including the functionalities of the artwork) inherent in the interface of the artwork. The affordances have been implemented as a part of the design process on the basis of the artist(s) conceptual knowledge. In order to make assumptions of the user, using readings of artworks as a platform from where to extend

into hypotheses about a human subject who transgresses many of the confinements of existing conceptualizations of the human subject (the black box, the division of sense-modalities, cultural semiotic systems, and none the less: subject-object divisions), we must have a theoretical frame in which to make these speculations. This frame is the ideal user.

Internal semiosis: This terms points towards all processes that are mainly happening internal to the organism. In Brier (2008)

Nature: The project has established a working concept of nature that forms a theoretical tool that places demarcation lines between nature, culture and human subject, instituted with the purpose of further intellectual investigation: Nature can be understood as anything, in any material or non-material form, that works dynamically, that is process based, that affects the four dimensional world that we inhabit, and that has not in itself been directed by the conscious will of one or more human beings.

Phaneroscopy: Phaneroscopy is Peirce's version of a phenomenology. It builds on the central categories of firstness, secondness and thirdness, where anything manifested is thirdness, which, again, is a mediation between firstness and secondness. Firstness is what Peirce calls "pure feeling", or "pure potential", and secondness is resistance or mechanical necessity. If we see firstness as equal to consciousness, then consciousness is more primary than matter in Peirce's deep ontology. (Brier, 2008)

Phenosemiosis: This term is coined by Brier. It integrates an embodied phenomenology that incorporates central aspects from Maurice Merleau-Ponty's embodied phenomenology with Peirce's phaneroscopy and semiotics. Phenomenological experience thus becomes embodied, and it becomes semiotic. It functions as sign and through signs. In Brier, phenosemiosis is thought in its non-conceptual and pre-linguistic form (Brier, 2008, p. 396).

Pragmaticism: Peirce called his version of pragmatism "pragmaticism" in order to clearly depart from the pragmatism of William James. (Brier, 2008)

Self observation: With Luhmann and second order cybernetics as a partial point of departure, it becomes increasingly evident that all observation is not only observation, but also self-observation. By developing a broader theoretical account of what might constitute prerequisites for knowing, self-observation becomes extended, while simultaneously implicitly integrated in any observation. This is also what complicates the confidence in objective approaches, and what, becomes part of what produces the post-objective observer. In this project, the understanding of what constitutes self-observation is problematized and expanded with wide consequences for the understanding of the thesis proper, and its study of the relationship between the first and third person knower.

Semiosic: This is semiotics used as an adjective. When academic terms are used as an adjective, this inclines that the concept is assimilated into the text's conceptual thought level.

Socio-communicative, autopoietic language games: This is Brier's (2008) integration of Luhmann's autopoietically based social communications (Luhmann) with Wittgenstein's concept "language games".

Syntropy: The ability of nature to perfect itself. Albert Szent-György, 1977, and Luigi Fantappié, in Corpo and Vanninni, 2009, have both operated in original ways with approaches that emphasise syntropy rather than entropy or negentropy only.

Tacit knowledge: A concept used by Michael Polanyi (among others) that implies knowledge that is not produced by traditional academic methods, and which might not even be intellectualized and articulated as such, however, makes an impact on human knowing. Tacit knowledge is also implicit in Giuseppe Longo's argument, concerning what he calls "the epistemological turn". Michael Polanyi has originally written a book, concerning "personal knowledge", in which he argues for a post-critical approach to knowledge, and of which tacit knowledge is a part (Polanyi, 1974).

Technoetic Art: The term "technoetic" is coined by Roy Ascott. It combines "techné" with "noesis", which, in our modern context becomes the combination of technologies with studies of the "noetic", which means the inner levels, or rather "consciousness". Using this term emphasizes the centrality in taking issues of consciousness seriously, and it further emphasizes that our time is a time where it is particularly important to attain a focus upon the inner world, because contemporary technologies (computers, digital interfaces, synthetic biology, etc.), especially explored in artistic practice, seem to provoke such questions. (Ascott, 2003; 2008)

Text: In this project, the concept of text is used in its broad hermeneutic form (Gadamer, 2004), where it is understood as any format that frames and orders a product of communication, whether this is a book, an interactive artwork, or even a biological organism, the last of which is suggested by Kalevi Kull (Kull, 2002).

Theory/theoria: The concept of theory presented in this project refers to Aristotle's theoria, which represents an active strive towards wisdom led by inner pleasure, since the highest good of man, to Aristotle, is to know (Aristotle, 1998).

The socially real: A term originally suggested by Kate Forbes-Pitt (2012) under the inspiration of Roy Bhaskar's three ontological domains, and Fleetwood's extension of these domains (2005), however, changed so that it can encompass Brier's idea of socio-communicative autopoietic language games.

The virtually real: Is not, as in Forbes-Pitt, aligned with digital virtuality. It is referring to a level of reality that is less dense than the three-dimensional physical reality suggested by classical physics that forms an ontological onset on behalf of which much current philosophical theory is conceptualized. It relates to Massumi's "affects" that are reactions to information from the level of quantum potential, however, is expected to be more than mere potential, and to deliver real dynamical objects whose effects can be met in the three-dimensional world of particles and matter.

The materially real: The materially real refers to material levels of physical Nature

that can, at the present time, be measured and observed by human senses and technological aids.

The artefactually real: The artefactually real is the part of the physical-material world that is manufactured by human beings, including technologies and technological measuring apparatuses.

The ideally real: The ideally real forms the cognitive intentional approach to the world inherent in human subjects, however, in we have extended Forbes-Pitt's version, which, to a high degree, built on a further development of John Deely's theory of the self. Our level of "ideally real", is primarily related to Brier's concepts of thought and phenosemiosis, together with the cognitive functions of autopoiesis and the Wittgensteinian language games.

Thought Semiosis: Brier coined this term. In his description of thought semiosis, it represents the subtle interaction between the psyche and the linguistic system (Brier, 2008, p. 395)

Tychastic evolution: A concept used by Peirce that refers to evolution by chance. (Peirce, 1923)

Umwelt: The term "umwelt" was originally suggested by Jakob Von Uexküll, and contrasted by the term "innenwelt". The umwelt is the perceptually known part of nature to a species and to an individual – based on particularities in the perceptual system of that species and/or individual. The innenwelt is the subjective realm, the inner processes of modeling and languaging that takes place on behalf of perceptual information received by connecting to the umwelt (Deely, 2004)

Wisdom: Wisdom builds on knowledge, and it relates directly to experience and inner knowing, as opposed to reason and analysis. It is not mainly aimed for utility (Aristotle, 1998; David Bohm, 1980; Dorthe Jørgensen, 2002).

APPENDIX 2

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-Plymouth, England: Plymouth Universitet, July, 2009: "Aristotle Revisited".
-München, Germany. Macromedia Institute, November, 2009: "The Sense of Being Moved". 10th annual conference under the title: "Consciousness Reframed." (http://www.planetary-collegium.org)

-Guimaraes, Portugal, April, 2010: "The Material, the Mental and the Virtually Real". Conference: Skilled Art. (http://www.skilledart.eu/index.cfm?opt=3)

-Trondheim, Norway, November, 2010: "On light – and the flux of informative events in natures and technologies." Conference: "Consciousness Reframed 11". "Making Reality Really Real". TEKS, Norway. (http://teks.no/?page_id=137&lang=no)

-Stockholm, Sweden, May, 2011: "Consciousness – a multi-scaled flux of communication". Konference: "Towards a Science of Consciousness." Arranged by Center for Consciousness Studies, University of Arizona, Tuscon, Arizona, USA. (http://sbs.arizona.edu/project/consciousness/report_poster.php?p=C)

-Shanghai, China, August 2011: "On Extended Sentience and Cross-cultural communication – how to generate new stories of the human subject." Fudon University, Shanghai. Conference: Transcultural Tendencies– Transmedial Transactions. http://tttt.artlinkart.com/en/speakers.html

-Copenhagen, September, 2011: "A Cybersemiotic approach to technoetic arts: creative speculations on dry artificial text and wet biotext". Conference in the honour of Søren Brier's 60th birthday.

-Lisbon, November, 2011: "Consciousness, life, and the potential of an endobiological evolution", Consciousness Reframed 12: Presence in the Mindfield. Presented by Artshare. ')

-Keffalonia, Greece, Maj, 2012: "A short epistemological narrative on logos, telos and aesthetic reason." Ionian Center for the Arts and Culture. (http://technoetictelos.wix.com/conf)

-Tartu, Estonia: "Bio-logos: Asking for the logic of life through a study of artificial life art and biosemiotics." Biosemiotic Gathering, 2012. Tartu University, Estonia. (http://www.ut.ee/SOSE/conference/2012_biosemiotics/pdf/GatheringsProgram6.pdf

Lectures given:

-Phd-course on Cybersemiotics at Copenhagen Business School, August, 2012. Talk: Technoetic Arts and Cybersemiotics.

Teaching:

-September, 2011 till present: Philosophy of Science, Bachelor level. Lectures and Classroom teaching. At Copenhagen Business School (Bachelor students at three different educational tracks: Intercultural Market Communication. English and Organizational Communication, Economy and Mathematics.

Composite Sessions:

-2009: Valencia, Spain; Plymouth, UK; Münich, Germany

-2010: Guimaraes, Portugal; Plymouth, UK; Trondheim, Norway

-2011: Shanghai, China; Lisbon, Portugal

-2012: Kefalonia, Greece

Central conferences Attended:

-September 24-26, 2009: "The Copenhagen Neuroaesthetics Conference". Copenhagen University, Department of Arts and Cultural Studies. Denmark.

-January 21-23, 2010: "The Artwork between Culture and Nature". Statens Museum for Kunst. Copenhagen. Denmark.

-June, 10-11: DASTS (Danish Association for Science and Technology Studies) Annual Meeting. Danish Pedagogical University. Copenhagen, Denmark.

-September 4-7, 2010: DRHA 2010: "Sensitivity Design". 4-day conference, Brunel University, London

-September 16-17, 2010: "The Humanities Between Constructivism and Biologism". Copenhagen University. Department of Media, Cognition and Communication.

-October 15-17, 2010: Port 2010. "Biotopia". Conference. Ålborg University and the Utzon Centre.

-January 14th, 2011. 9.00 AM - 18.00 PM: Machine and Organism - on Synthetic Biology. Copenhagen University, Amager.

-May, 2011: Re:New. The Unheard Avantgarde. IT-University, Copenhagen, Denmark.

Workshops attended:

-April, 10th, 2010. "Healing and Biophysics" by Ignat Ignatov, head of Scientific Research Center of Medical of Biophysics, Sofia, Bulgaria. Held at the Copenhagen Reiki School in Hørsholm, Denmark.

-September 29th, 2010. "The Energy Crisis in Medicine". By biophysicist James Oschmann. In Cooperation with the Stanley Rosenberg Institute and Quantum Health, Denmark.

-September 30th, 2011: "The Sensuous Object". Medical Museion, Copenhagen, Denmark.

PhD Courses attended:

-21.-25. March, 2011, Mon.-Fri. 9 AM – 4 PM: Philosophy of Science. By Professor Søren Brier. Kulturarvens Forskerskole. Copenhagen S. 5 ECTS

Exhibitions and festivals attended:

-July, 2009: "Future Lab" Museum in Linz, Austria.

-October, 2009: "Scinterfaces". Casino Luxembourg. Luxembourg City.

-October, 2009: "Jeppe Hein". Aaros Museum of Art. Århus. Denmark.

-February, 2010: "Kinetic Art Fair". London.

-May: "Re:New", Art Exhibition, Huset, Magstræde, Copenhagen

-September, 2010: "Sensitivity Design". Performances and installations, Brunel University, London.

-October, 2010: "Biotopia". Bioart in the Utzon Centre. Aalborg, Denmark. Arranged by curator, Morten Søndergaard.