

The Book of Desire: Toward a Biological Poetics

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Received: 15 May 2009 / Accepted: 22 March 2010
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Abstract In this chapter I propose to understand the current paradigm shift in biology as the origination of a *biology of subjects*. A description of living beings as experiencing selves has the potential to transform the current mechanistic approach of biology into an embodied-hermeneutic one, culminating in a *poetics of nature*. We are at the right moment for that: The findings of complex systems research, autopoiesis theory, and evolutionary developmental biology are converging into a picture where the living can not longer be described in terms of causal mechanisms (as is, e. g., the Watson-Crick “central dogma”). Instead, organisms bring forth themselves physically and thereby generate a hermeneutic standpoint, interpreting external and internal stimuli interfering with their auto-creation according to embodied values. This can be observed empirically during embryonic development, where genetic instructions do not act as orders, but rather as perturbations being interpreted by an auto-maintaining developmental centre. The notion of organic subjectivity opens the living realm to a hermeneutic perspective. Since any encounter has a meaning and is interpreted accordingly, it creates a perspective of innerness or *self*. This self experiences all external and internal stimuli as values. The innerness is coextensive with the material dimensions of biochemical processes as their other, or symbolic, side. By this process the subjective perspective of organisms is open to other’s experience. Meaning and value become visible, as they are generated in material, embodied form. Instead of being separate from nature as pure “mind” or “language”, man shares with any other being the same “*conditio vitae*” of experienced meaning and expressive feeling.

Keywords Embodied subjectivity · Autopoiesis · Embryonic development · Innerness · Values · Interbeing · Poetics of nature

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The essence of life is contained within the substance of life and cannot be 'extracted' without killing life; full transcendence, therefore, is impossible.

John Bryant (2006)

Introduction: The Rise of a Biology of Subjects

Several years after the decoding of the human genome, biology has moved to a new level of questions. This shift follows from a rather unexpected outcome of the largest sequencing project ever undertaken: the number of human genes discovered was much smaller than expected. As a result, attention quickly broadened to include not only genetic sequences but also more systemic problems of regulation and development. In the very few last years the overall biological picture has become much more complex than it had been previously.

Beyond the already highly complex layer of genes there is the level of genetic interaction—the genetic “computer” which is scaffolding ontogenesis, mediating external influences, and acting as a frame for somatic self-reference (Kirschner and Gerhart 2005). Epigenetic regulation plays a much more important role than previously thought, enabling the individual organism to have influence on the fate of its genes (Jablonka and Lamb 2005; Bauer 2008). It is now well-established that parental behaviour can be passed on genetically (Bauer 2008) and even that cultural practices of child treatment may directly influence childrens' genomes (Powell 2009). The emerging, more holistic paradigm of biological regulation and identity also takes into account the fact that the identity of biological subjects is often not that of one species alone: recently, the fact that most higher organisms are to be viewed as “metabiomes” consisting of thousands of symbiotic, mostly bacterial species, has come to close attention (Ley et al. 2008).

Many of these findings question the methodology of biological science as such, which has until now been guided by a thoroughly mechanist approach grounded basically in classical physics (see Weber and Varela 2002 for an enlarged discussion). Particularly, and rather unexpectedly, the Central Dogma in genetics has come under attack. In understanding exactly how—and whose—genes “make up” the body, the view that life is organized like a chain of military orders falls short. We have become aware that an organism must on the one hand be viewed as an ecosystem, as a “superorganism” built from innumerable cellular selves (Turnbaugh et al. 2007). On the other hand, it is now well established that the single organism is not a linear cascade of causes and subsequent effects. Current views in empirical biological research, particularly in developmental genetics, proteomics and systems biology, are beginning to appreciate circular self-production and autopoiesis as central features of living beings. Genetic coding, developmental and regulatory processes are increasingly discussed in terms of interpretation, biological meaning and subjectivity (Kirschner and Gerhart 2005).

These findings not only challenge the empirical approach to the organism. They also transform our underlying assumptions about what life is. Is an organism a machine, assembled from parts which have to be viewed as still smaller machines? Or is life a phenomenon in which subjectivity, interpretation and existential need are key players that cannot be excluded from the picture without distorting our

understanding of life—and without obstructing the path to further explaining an organism's functioning?

In this chapter I want to explore what consequences the new empirical holism might have for a picture of the living and finally for an understanding of ourselves as biological entities. If the organism is the unfolding of a dimension of meaning and values, the right way to approach living beings might no longer be mechanistic but hermeneutic. This basic shift in the understanding of life not only changes our viewpoint concerning biological laboratory research: it also affects our own relationship to all of nature—and hence to the cosmos with which we are involved. If organisms are to be described not only in terms of mechanical laws then we have to readjust the border between empirical science and interpretative science. By subjective interpretation of encounters according to needs, living beings seem to follow the paradigm of hermeneutics. Living subjectivity might even be called the prime hermeneutics—the first step in the way the world experiences itself by necessary interpretation according to desire. The organism is thus the primary unfolding and first paradigm of subjectivity. Interpretation from this viewpoint no longer seems to be based on human language or texts alone. Rather, the domain of interpretation starts with the organism. Subjectivity, not objective relationships, are at the forefront of any biologically possible experience—including our own.

The hermeneutic approach I will be exploring in the present chapter appreciates that the subjectivity of organisms is a physical factor. Organic subjectivity might not be an epiphenomenon but rather its opposite: the foundation from which an explanation of life has to start. The hermeneutic approach in biology discovers value and feeling at the centre of a physics of organism—and not as one of many possible points of view but as a necessary element of a scientific description of life. If we take the coming interpretative paradigm in biology seriously, we need to develop a biological poetics which includes natural science (as the science of living and hence expressive subjects) and cultural poetics in a narrower sense. The endeavour of the following paragraphs is to explore, in a preliminary sketch, where that biological poetics, or General Hermeneutics, the new science of ubiquitous *poiesis*, could reasonably start from.

Life as Embodied Identity

I will first outline an alternative approach to defining life, drawn mainly from the theory of autopoiesis. On this basis I will demonstrate that the realization of life always includes an expressive aspect. I argue that, from an autopoietic point of view, the organism is embodied cognition; hence, its “outward” shape is a sign of its “inner” feelings. The theory of autopoiesis, and particularly its development by Francisco Varela, provides a basic but non-substantive definition of life. “Organisms”, Varela (1997) writes, “are fundamentally a process of constitution of an identity”. Organisms bring forth an identity as a material process: the observable *telos* of metabolism is to perpetuate itself. A living entity produces itself and all its components autonomously. It is distinguished by the ability to retain its integrity in the face of changes in its environment. It generates the structure as well as the border of its surroundings. The whole organic machinery

has one primary goal: it produces exactly the components that have produced it. Ribosomes enable proteins to be formed that in the end become ribosomes. Cell membranes which are brought forth by the cell interior shelter the cell interior to produce membrane components, and so forth.

Directly or indirectly a cell's activity is 99% concerned with the maintenance and the unfolding of itself. This observation can be expanded from single cells to multicellular life forms. A very high degree of self-relatedness is also valid for higher levels of more complex organisms. In vertebrates, the overwhelming bulk of all neuronal activities has nothing to do with external stimuli but is an occupation of self with self (see Varela et al. 1991). On the other hand, this cellular or multicellular-somatic self so obsessively concerned with itself must neither be understood as any kind of fixed unity: it is important to see that the living entity exists as a certain self-identical structure in space and time, although it is at no moment materially identical with itself. Matter passes through its changing spatial arrangements. Only the fact of being alive keeps this circuit closed. When an organism dies, the process comes to an end, and the components behave as normal chemical compounds tending to assume the highest possible degree of entropy: they decay.

The organization of that which lives is therefore characterized by the conjunction of two different ontological realms. Unshaped matter and the process of regulation only together make up the proper reality of the organism. This processual circularity is a fact that biology must take into account. The process of living takes place in normal matter, only the latter is organized in such a way that it shows autopoietic behaviour. The autonomous encounter with reality—an encounter that is not completely causally determined—is called “cognition” by Varela. He uses the term not in the classical sense of the cognitive sciences (which understand by “cognition” the logical operation of symbols) but rather to emphasize the creativity of opening up a world of interactions relative to the system. Symbols here are the physical forms the organism acquires when it constructs itself according to the meaning of external and internal stimuli for the ongoing self-production process. In that kind of cognition, organisms create relevance by separating the outside from themselves, while at the same time being dependent on it.

From where does this autopoietic tendency stem? What is this desire for wholeness? Even though we are not able to give an empirical answer, we cannot exclude the fact of intentional striving from a real picture of what life forms are doing. It seems that we have to take this tendency into account as something just normal in the cosmos. And there is a bulk of empirical evidence that shows that obsession with complexity—an obsession to enhance life—is everywhere. Research into self-organization and complexity have shown that we have to admit an increasing tendency to creativity, to the unfolding of higher complexity and “order for free” in our world (for the current state of the debate see Kauffman 2008). We can for example view autocatalytic networks as simpler precursor systems of the cell's autopoietic behaviour. Autocatalytic networks are made of a high number of different reactive components (like it is the case for a cell which contains a host of different molecular classes). At a certain complexity or “possibility”-level these components start to catalyze many new reactions, so that there may be one catalysis per class of components. This leads to a “crystallization” of structure which starts to

sustain itself. (For a detailed discussion see also Weber 2007a; for the biophysical background see particularly Kauffman 2000).

The transition of the physical level of energy to the level of significance happens every time the organism—on the simplest level, a single cell—manifests as a “whole”. Meaning therefore is co-extensive with life. Every relation of energetic exchange is a relation of signification brought forth by the existential background of the organism. By self-confirmation, the non-self as Umwelt is separated off; and this separation opens the possibility of interaction with the Umwelt, for better or worse. Seen from the organism’s perspective, the organism’s domain of action is its unique standpoint. This standpoint separates the own cell-body, which is to be developed and protected, from the surroundings, which are thus valued as good or bad prospects for the self-realizing organism (Weber and Varela 2002). Every living being therefore interprets the world according to its needs, and its desire to carry on and prosper. The world thus gains, in the same movement by which self and other are divided, existential significance for the emerging self. A “perturbation”, in autopoietic terms, is a stimulus that interferes with the organism from the outside, causing it to react in a way that is determined only by its inner processes and states. Hence, this stimulus is interpreted. Here is the beginning of the new biological approach this chapter is concerned with: when organisms are conceived of as autopoietic systems, meaning is their fundamental dimension of existence. Probably here lies the true boundary that separates the organic realm from pure matter. It is the organism’s paradoxical dependence on its surroundings that lends an irrevocably existential value to those surroundings.

Living beings are those entities which are first and foremost concerned with themselves. All other descriptions that overlook this auto-relatedness must miss the most important point of defining life and the living. Any comparison to an artificial machine leads the wrong way, as no machine intends its own continuation. Machines, as man has constructed them, process matter, consume energy and produce things. (And they generate waste, which is also not found in living nature; here used-up material is always a starting point for new sense-creation by other biota). Artificial systems do not produce themselves. Even the most advanced self-constructing robot depends on high-entropy building blocks that have been prefabricated by man. Life in contrast to that is the obsession by which a lump of stuff tends to maintain a certain form and a certain way of acting. A living cell is always involved in auto-creation. It is the material realization of the principle of subjectivity.

In a manner somewhat redolent of the new picture in physics that quantum theory opened up 80 years ago, such a perspective departs from linear causality: cells react with a certain autonomy. How they act does not only depend on an objective constellation, but also on their inner state, context and meaning, as well as on what an observer is doing or not doing. Organisms are highly complex and intelligent, not trivial and deterministic—and are certainly not molecular clockworks teleguided by their genetic software.

This persistent pursuit of their own being and well-being is ontologically the basic character of life, from a simple cell onward. The most important feature of a cell is the fact that it consistently restores itself and brings forth all its constituents. Cells show a breathtaking perseverance. In a steady exchange of matter with their

surroundings they resemble batteries that continuously recharge themselves. They spiral upward on their genetically inherited molecules, but they do not follow their code like an inevitable instruction, but rather in a continuous dialogue between self and other, subject-pole and surroundings, not determined, but rather orchestrated by their genes.

The major portion of biochemical activity is invested in keeping alive the inner order, to stabilize it, to enlarge it, to rebuild it. An organism maintains itself against the steady pull of disorder, against quantum fluctuations, against the mass of minuscule breakdowns. A single bacterial cell continually repairs DNA errors. Otherwise a cell's life would end within moments. It would gradually decompose. And just that happens when death occurs, when a living being is no longer able to define itself as a centre of activity. But there is more: life does not content itself with defining itself as a centre. It reaches out to unfold more of itself. Life is longing for further life to subsist: what we perceive as sustainability is always enhancement.

The prototype of any subjectivity thus is a subjectivity of body, not of mind. Its defining character is the autonomy of form over matter while at the same time form is dependent on exactly this matter. The living cell governs the atoms that make it up. The identity which is brought forth through it holds and moulds matter. Therefore we can introduce another term by which we can summarize the qualities of subjectivity and autonomy—qualities that are themselves already rather unexpected in a biological description of organism: an organism displays a certain degree of *freedom*. A bacterial cell has many more possibilities to choose from compared to, say, a grain of sand. A microbe does not ponder about how to meaningfully spend the next day, but neither does it lurk around like lifeless matter. It decides and chooses according to needs which arise from the tenacity with which it realizes itself anew in every instant. It is free because it shows an intention to carry on—or rather: it is free by necessity. In this new perspective on biological science cells appear as units of will. This cellular will is not like ours, personal and conscious. But still it is the will of life to unfold itself. Therefore it is something which we also find within ourselves.

Evo Devo: Interpretation in Action

The first step towards an embodied hermeneutics is to take into account the intentional habit of matter whose consequences I have described so far. This is indeed what many research groups do at the moment: They start to rediscover intentionality as an empirical fact. Actually, this is no wonder. Although intentionality has ‘gone lab’ only very recently, it has been lying in wait for years. Already the “old” genetic paradigm was formulated in the cryptosmiotic language of DNA as a code or a text, hence demanding hermeneutic understanding, not causal determination (Hoffmeyer 1992). But now a much broader empirical view of embodied interpretation comes into sight.

In the emerging picture, genes do indeed play a central role—but it is a role very different from that which most authors previously assumed. “The miracle of complex life is more amazing, yet ironically simpler, than anyone ever expected”, states developmental biologist Sean Carroll (2005). Experiments have long shown

that many biophysical structures—such as fur patterns or leaf surfaces—reflect processes of self-organization without the involvement of precise genetic instructions. Biological order arises “for free”. But in the past few years researchers have observed that whole embryonic growth centres unfold largely independently of genetic commands. Embryonic tissues and organs organize themselves as centres of concern: they try to keep themselves closed and intact over time (see Kirschner et al. 2000; Kulesa and Bonner-Fraser 2000).

The American biomathematician George von Dassow and co-workers (2000) recently found that during somatic development a given number of genetic switches can be connected in only one way to bring forth a specific body trait, e.g. an organ. But if such a network has been started and runs, it is resistant to a whole range of influences. The group simulated *Drosophila*'s segment polarity network by computing a set of 136 differential equations symbolizing a large number of parameters as half-lives, diffusion constants, binding rates etc. “The network’s ability to pass our test is intrinsic to its topology rather than to a specific quantitative tuning. There are so many diverse solutions that the notion of a global optimal parameter set [of genetic commands] makes no sense”, comment von Dassow et al. (2000) about their work on genetic regulation of the chicken developmental centre. Elsewhere they comment that “The simplest model that works at all emerged complete with unexpected robustness to variation in parameters and initial conditions”. Once it kicked in, it remained going. Dassow et al. are convinced that “robust gene networks are the only networks natural selection can evolve”—networks which hence are not guided hierarchically but rather form a chorus of independent components (for further details see Keller 2002).

In the new emerging picture, DNA is a scaffold for the flesh, not its blueprint (for an enlarged idea of DNA as a “scaffold” see Hoffmeyer 2006). DNA does not carry instructions, but rather allusions: the body must “read” the genes according to its overall capacity to understand them. It must interpret the sequences and transform them into sense. We should therefore no longer view DNA as a machine code to execute orders, but rather as a kind of score in relation to which the cell can choose different instrumentations according to its status. Also, the DNA is much more part of the cell’s metabolism than the fading dualist blueprint metaphor suggested.

Contrary to what had been supposed, then, the genome does not carry a homogenous blueprint for a living being. The different components that assemble the hereditary molecule are better understood as an assembly of scattered fragments and pieces of relative meaning which alone could never make up an organism. Most of the genetic material does not encode proteins, but works as switches in a wider developmental and metabolic network. The formerly so-called “junk DNA” plays a major role in this cellular “neuronal net”. Most of it is involved as genetic switches and toolbox genes in metabolic and developmental regulation, not in gene-product coding. And the genes themselves are not forever fixed in one state. As would be suspected of flexible players in the metabolic game, genetic sequences do not represent permanent law, but can be processed by the soma, e.g. via extended “capping” or by methylation of genetic promoter regions.

Genes should thus be viewed as the “nervous system of the cell” rather than as mechanistic sets of orders for ready made proteins. The genome contains several

pathways for genetic switches (e. g. via genetic enhancement or repression and via miRNA) which are wired in a way that calls to mind a massively parallel computer (Bauer 2008). DNA is therefore less an information store and more a highly complicated cognitive subsystem concerned with meaning.

The choice about which genes are activated and actually produce proteins is dependent not on an unequivocal “order” but rather on the outcome of a virtually endless number of possible connections. Not blunt genetic information, but rather the network and its emergent properties—and above all its emerging autonomy—decides which organism will be built up. But the decision is taken only by doing. The computing of the developmental centre *is* the unfolding of the organism. It is enacted in real time when the developmental process has been started. Once switched on, tissue developmental centres follow their trajectories without paying much attention to (non-lethal) disturbance.

The developmental pathway should therefore be compared less to a chemical reaction (as is still the norm in biology) but to complex behaviour. Cell arrays, e.g. in liver tissue, differentiate when they are “tuned” in a certain way by the sum of all different inputs by every other cell and by all additional triggers in their close as well as further vicinity. Like a songbird which starts to build its nest when longer daylight and warm sunrays have raised the levels of hormones in its blood, cells respond to the DNA’s message according to their individual situation—each time in a different and adapted way.

Kirschner and Gerhart (2005) have coined a new term for this cellular obstinacy about deciding which stimulus to obey: they call it “weak linkage”. This term, not in a very easy-to-read but rather in a somewhat hidden way, gives up the classical model of causality. Cells and genes are not related by a simple cause and effect linkage, as are e.g. the motor and throttle in an automobile. Cells “interpret” the DNA in a kind of consensus procedure, but cells do not “obey”. Kirschner rediscovers as an empirical precondition for embryonic development exactly what Varela has postulated by his autopoietic definition of the living as process-of-identity: cells and tissues are autonomous to a certain degree. They behave as a whole which interprets stimuli but which is not, like a machine, dependent on causal perturbations, or orders. There are no such orders. For Kirschner and Gerhart (2005) the “information” contained in the DNA does not represent an all-determining set of instructions which the cell blindly follows. Rather, it is one stimulus amongst many others, among which are, for example, the state of all the surrounding cells, the temperature, the distribution of signal molecules and hormones, light, darkness, presence of symbionts and other microbes, and so forth.

Because of this inter-relatedness in the way in which a cell is “tuned in” to its total environment we have to accept again that from the very beginning there is a hermeneutic aspect to the living being. Since a cell acts as an interpretative receptor of outside stimuli it constantly mirrors every influence that reaches it. This is the start of the endless mirroring process of meanings which an organism is constantly thrown into. We can say that the behaviour of one cell expresses the situation of the overall system—and more. As the system is enfolded in its ecosystem, and via this in the whole biosphere and semiosphere, this mirroring is potentially endless. This is a most remarkable finding. Only if we conceive of the cell as an individual, and hence as something emphatically closed to the environment and not open to its

deterministic influences, is the cell liable to mirror anything within its (potentially endless) reach.¹

The hermeneutic viewpoint is thus not just a perspective from the outside, a new look upon life as meaning-relating. Rather, the hermeneutic view guides any analysis of the biological processes in virtue of being the way the biological reality on the “inside” is organized, as the way an organic perspective is born. Hermeneutics therefore provides the central guidelines for understanding biological interactions. Symbols and meaning present the basic framework to analyze all biological processes. Expression is the most primitive reality of life.

Now we have come to a very important point: hermeneutics starts with body, not with text. If we describe the life-process as subjective, symbol-generating and meaning-dependent then we already have established the crucial interface between organism and cultural and mental symbolic processes. Our new description of organism points directly at what Feyerabend (2009) has termed the most characteristic problem of occidental philosophy: the mind—body duality. We elaborate on this idea in the following paragraphs.

Unfolding the “Interior” Dimension

Biology is about to encounter a paradox which is not very different from the situation with which physics has been struggling for the past hundred years or so. In a physical micro-level description boundaries have been blurred between what is objective reality and what is only defined by subjective intervention. In quantum physics matter is neither wave nor particle nor even a final reality—but still it is the envelope of all experience. Physical science had to include (though hesitantly) the subjective dimension of the quantum approach because otherwise certain mathematical problems could not have been solved. A hermeneutic description of organism represents a somewhat similar solution to two previously irreconcilable points of view in biology. It links for the first time in the long history of biology the third-person objectivist approach and the first-person symbolic approach which is the basic way of lived experience in the first place.

In a hermeneutic biology a living being is neither only matter nor only form—it is an embodied subject which can make choices concerning the relationship between these domains. Life is matter and meaning at the same time—“inside” and “outside” intertwined. Metabolism therefore is a process by which bread indeed is transformed into flesh. But the mysticism involved in that conversion is plainly empirical. Matter flows through the subject, which in spite of this fluctuation at each given moment only consists of this flowing matter. Via this atomic flux any subject indeed is linked to everything else. By labelling the particles involved in metabolism we could show that the same atoms that build ourselves are first in the grains, then in the food, then in the muscles. Matter streams through the body and for fragments of time assumes its fixed substance, only to be shed—so that later it can be rearranged in other

¹ It would be very interesting to explore on a deeper level the relationship between this biological-hermeneutic idea and Leibniz’s conception of the monad as closed to the world and at the same time holographically concentrating every aspect of it. For more discussion on this see e. g. Deleuze (1988).

individuals. In this view the whole physical matrix flows through every organism in any given moment of time. Every living being is a node that enfolds all matter. In that sense every organism is indeed a “centre of the universe”, as the Russian writer Solshenizyn had it.

To be able to be this centre, every organism must be fragile, dependant on a new influx of high-entropy matter, and, ultimately, must be bound to die. Only the organism’s vulnerability and its final failure—death—engender the form of intentionality or interior perspective described so far. This perspective at the most basic level is the subjective standpoint that collects and combines the organism’s experience, seeks out new encounters, avoids negative influences and attempts to prosper. To maintain itself as a definite form in matter the organism manifests a directed tendency, an active interest in its own continuation. A system that has an interest, however, does not experience the world as it is “in objective terms” but according to its needs. An ant does not follow a sugar scent because it recognizes its components objectively (or consciously) as food but because the taste means a positive value to it. At first sight, the behaviour of such a seemingly simple being as an ant might look like that of an automaton. But exactly the fact that this living being is able to act according to goals in a complex and chaotic world proves that it does not act as a machine.

If the physics of organism, which is characterized by “weak linkage”, by a meaningful standpoint, and ultimately by autopoietic autonomy, has to be conceived in hermeneutic terms, then the exterior reality of such a process of self-realization must also bear traces of meaning. If the physical appearance of organism is characterized by subjectivity and only subjective needs are able to canalize the flows of matter through the cell, then matter must express this subjectivity and therefore display lived interiority. In this light nature is no longer a mute and neutral setting but is flooded with expressive power. The feeling of living beings—their active experiencing of lived existential hermeneutics—is accessible in their physical and aesthetic presence. Consider that the first and most intuitive reaction of human beings to the “real biology” of wild nature and other beings might be just this: being overwhelmed by the appearance of other being’s lives.

Let us look more closely at the steps leading to this view. The reaction of living systems to material constraints is the unfolding of a dimension of meaning. For a living system, continued existence toward processual closure is intrinsically the subjectively absolute goal of the system. Since the generation of meaning is an embodied process taking place in matter, this absoluteness of meaning is also noticeable externally. A subjective impression of a perturbation, as the term was explained above, must therefore always be connected with an expression. This follows from the logic of autopoiesis: because biological self-production occurs as a material process, every signification is primarily a material one. Only by this material process is the subjective perspective obtained in the first place. Therefore, in the external quality of autopoietic systems, meaning appears as form. As such it reveals itself in a sensually graspable manner. This implies that the mode of being of organisms has an irreducibly aesthetic side. It is through the appearance of living beings that the hermeneutic mode of being which we call life becomes fully visible. Hence the magic of nature’s presence, which always seems to tell us more than we can understand—although we can understand it to some extent. I will come back to the idea of self-realization of man in nature later.

The relation between “inside” and “outside” in our definition was prefigured by the autopoietic self-realization as an embodied process of identity. There, meaning for an organism becomes evident in the perspective of concern. But now we see that meaning is always a bodily, material process, because the living system really exists in space and time and because the process of living is about maintaining a continued identity as matter. The behaviour of living beings is an endless row of acts where meaning becomes transparent. An animal will react to a shock by flight, to a wound by hiding, and, later, by bearing a scar. A tree on a steep slope will visibly force its roots into the soil. There is a general exterior aspect to autopoiesis because organic systems are embodied, because they are reacting as bodies in space to their worlds.

A system’s inward reaction to a perturbation, and its necessary generation of meanings, therefore appear externally as the system’s mode of reaction to stimuli. The “outside” is the first place where this meaning visibly appears. Both dimensions, inward and outward expression, feeling and form, are aspects of one and the same meaning-generating process. The difference between “inside” in our subjective sense and “outside” in the sense of a morphology is therefore only a distinction between modes of expression. In this sense we can define subjectivity generally as “concerning the perspective of cognition and of semiotic self”. This perspective is manifest in an “inside” and an “outside”. It will show up both inside and outside, because neither is possible without the other.

Cognition, as the complete self-realization of a living organism, is visibly embodied. It is the transparency of an invisible “inside” on the “outside”, a level of expression within the bodily reality of coping with the world. Form is thus necessarily related to what an organism experiences from its inner perspective. The living body therefore is the ground zero of every possible reality. Living cells and tissues are the forces where the desire for life tries to overcome the dire immobility of matter. The physics of life therefore discovers the individual body—and not the anonymous anatomical machinery—as the decisive factor for the understanding of subjectivity, meaning, and interpretation. Because of this lived hermeneutics, the secret feeling of life is tied to matter which is organized in a way that is able to experience.

Lived subjectivity becomes transparent in matter. Therefore it impregnates matter with an interest and a perspective and gives beauty to it. The subjectivity of the living form inevitably projects itself on the surface to be seen, smelt, heard, and touched. In this respect every living being is an open book, and more: it is an instance of acute, existential, real presence.

Interbeing: Subjectivity Beyond Embodiment

We can exchange messages about what it is to be alive through the eloquence of our fragile bodies. However, this exchange never takes place between individuals that are complete for themselves and closed to the outside. As we have seen, a subject is never closed in a material sense. But it is also open in an experiential or symbolic sense. The subjective inside therefore can only be understood as “interbeing”. It is rather by an exchange with the other that a subject is able to arise in the first place. This dialectic between self and other is prefigured by the fact that the autopoietic

circle of self-affirmation is possible only through the constant metabolic flux of “other” through the centre of self. Matter changes, and only by this change, by this continuous “sucking in” of the world and the subsequent transformation of this “other” to “self” does an individual arise.

The particular symbolic importance of the other in constructing the self has become particularly visible in recent psychological research concerning newborns. Only thirty years ago, infants were treated as completely blank slates existing in a mere vegetative state (the time when they underwent surgery without anaesthesia passed only very recently). Meltzoff (2005) paints a picture completely different from that idea of babies as not-yet-full-beings: he describes newborns as wholly developed subjects. Meltzoff observes, for example, that infants are able to imitate a wide range of facial gestures directly after birth. This ability to see the other as a body and to steer one’s own body from inside closes the gap between inside and outside: “The ability of young infants to interpret the bodily acts of others in terms of their own acts and experiences gives them a tool for cracking the problem of other minds.” As Meltzoff and his co-workers have shown in a wealth of trials during the last decade or so, the ability of newborn babies to imitate faces is not a reflex, as it has been shown to be too variable, and too good an imitation. Apparently, neonates must know, or rather feel, that what they see there in the face of their mother or a scientist is what they too can produce on their own face. To be able to imitate, they must make a direct relation from their inside to their outside. They must know that they are outsides with an inside, as well as that the other is this too. Meltzoff and Moore (1995: 53–4) have suggested as an explanation a primordial connection between self and other via a “supramodal framework”. They put forward “an intrinsic relatedness between the seen bodily acts of others and the internal states of oneself... This primitive self-representation of the body may be the earliest progenitor of being able to take perspective on oneself, to treat oneself as an object of thought.” (1995: 53–4). By a related argument, primate researcher and cognitive philosopher Frans de Waal puts forward a universal “perception-action-mechanism” between all higher animals, making subjective states of the other accessible as experiences of one’s own body (see Olbrich 2009: 119).

From this analysis of subjectivity as primordial intersubjectivity we can infer some important consequences. The most significant of these is perhaps the prospect that the self-experience of subjectivity must always contain a dimension of otherness. We must thus view the newborn child as a paradigm for inside-outside “knowing” as experiencing subjectivity. To such a subjectivity, the comprehension that outsides have insides follows from the very fact that it exists: subjectivity is an inside with an outside. We could thus infer that for the newborn there is nothing more normal than the fact that its mother is a subject with an (emotional) inside. But in addition we could postulate that any subjectivity conceives of the world according to the experience of this primary relationship between inside and outside.

We have to realize that the idea that outsides have intentional insides is the normal viewpoint for a living subject—something which *is* an inside with an outside. It is perhaps for this reason that a child experiences the whole world as animated. Here we come upon another long-cherished fact of psychological dualism—the prejudice that a child is born into primary narcissism and cannot distinguish between itself and the other world, for example its mother. Whole psychological theories of personal

development and psychopathology have been built on this notion of a hierarchical development starting from the “oceanic feeling” of oneness with the world. The myth of prenatal “oceanic feeling” became an unproven standard in infant psychology through Freud’s teachings, but was grounded on no evidence at all.

From our hermeneutic point of view, we cannot agree with the myth of oceanic feeling. Conceptions of that kind still demonstrate the (crypto-) dualist and objectivist approach long prevalent in psychology and psychoanalysis. But they are not based on the facts of experience. It is probably not the case that the infant in the beginning does not feel any separation between itself and the world, or special parts of it like its mother. Rather, to feel one’s own separation from the world is the necessary precondition of subjectivity. To be an embodied subject means to be separated. But to be a subject is at the same time only possible through the mirroring by other outsides that symbolically, and hence relationally, contain aspects of the own self. It is certainly this reciprocal mirroring which characterizes the relationship between the infant and the child’s mother, or father, or any persons caring for it.

Meaning and Subjectivity: The Lingua Franca of Life

In a hermeneutic biology the subjective dimension is all-pervasive. Any event has a meaning for the living framework of the body. Any contact towards the world comes about in the sphere of subjective meaning. It is anchored in the expression of a body which displays experiences, i.e. the significations of what has happened to him. Subjectivity becomes visible—be the organism conscious of the experience or not.

These ideas might be useful for addressing important questions in brain and consciousness research which still circle around the “hard problem”. Chalmers (1996: 4), who invented the term, has defined the “hard problem” of neuroscience thus: “We can say that a mental state is conscious if it has a qualitative feel... The problem of explaining these phenomenal qualities is just the problem of explaining consciousness. This is the really hard part of the mind-body problem” he writes. For Chalmers the decisive question is how our own subjectivity is related to the world. If we continue further down Chalmers’ line of thinking, another question follows: what relates lived subjectivity with consciousness? How does consciousness arise from subjectivity? Who has it? Only humans? Just higher animals? Or all beings? The hermeneutic approach, however, no longer takes the hard problem to be really hard. If embodied subjectivity is the central drive that holds together a living being, then here—and nowhere else—we must look for the trail leading to consciousness.

As Damasio (1999) has shown, consciousness is not possible without processes of subjective feeling in certain brain regions. From a hermeneutic standpoint, this situation is not only caused by brain organization. Rather, the import of feeling is due to the fact that the phenomenon of the living is the embodiment of subjective identity, which already is feeling. Consciousness somehow reflects this subjective identity. There is no subjectivity that is uncoupled from the body. This perspective seems to be the only way out of the deterministic trap in neuroscience that has recently regained momentum. The deterministic argument is illustrated by Benjamin Libet’s famous experiment (Libet 1985). He illustrated that there exists a time-lag between the neuronal impulse to raise an arm and the conscious decision to raise the

arm: the decision to act is perceived by the subject after the motor impulse that contracts the muscle.

For many authors the order of this sequence seemed to prove that the body enacts decisions mechanically before our mind is permitted the illusion that it has taken the decision by itself. In explaining the Libet experiment with our new hermeneutic approach to consciousness we witness the crucial changes living subjectivity brings to the idea of mind: it closes the dualist gap. Subjectivity is no longer outside, but already “inside” as the inner perspective of a living system. The body is a subject, not the “mind” alone. This changes the interpretation of the Libet experiment. If the body takes a decision before “our” consent then this only shows that the symbolic mind is not the almighty governor of the body in a dualistic sense. Seen in this light, Libet’s experiment works as a further proof that autonomy is a real trait of living systems. If the material, embodied identity already has a subjective standpoint, then where is the problem with autonomy? It is this embodied autonomy which is realized by personal consciousness as one’s own autonomous decision.

If we want to get closer to an understanding of consciousness as part of the overall hermeneutic picture of organism, we have to discard the idea of an immaterial mind, not the notion of individual freedom. This freedom rather reveals itself as the organic core reality. It has its roots in the self-realization of the living, not in any purely mental freedom from matter. The discussion about how to interpret Libet’s results therefore shows how deeply engrained a dualistic standpoint still is among researchers. But to come closer to an understanding of consciousness we have to look more deeply at the centre of subjective concern which guides an organism’s behaviour. Things are the reverse of what was previously thought: it is not that if we understand how consciousness has been miraculously brought forth by a mechanistic body-machine then can we understand “subjective feels”. Rather only by comprehending how lived subjectivity manifests as a centre of concern will we be able to explain consciousness.

As we have seen above, value guides the self-maintenance of a cell. Therefore value as the import attached to sustaining and unfolding the proper existence is the pacemaker of life. Jaak Panksepp (2001) calls this intentional standpoint the “core self”. In the core self, the status of the body (and hence, the body-subject) is mirrored and symbolized. The core self is the existential, and hence also the hermeneutic, anchor of an individual. Here the meanings of the organic processes are collected, integrated and interpreted. This interpretation is not mathematical, but experiential: it is what we perceive as the “subjective feel” Chalmers (1996) is talking about and what he is putting centre stage to tackle the “hard problem”.

Yet the core self is not the central processor of a hardwired body. It is not a physical hub but a subjective standpoint. How can we imagine how this core self comes about? The process of valuing the states of the organic self is not simply located at the material level of neuro-endocrinological chemistry. To make an organism feel its own status there must be “neurosymbolical” processes at work (Panksepp 2001). Panksepp argues that the core self assesses the experiences and inner states of a being. The “subjective feel”, what we have called here interior perspective, is just what the biological processes mean for this embodied subject on an existential level. Thus, the core self must be understood as the meaning of bodily processes. It is their persistent and irreducibly subjective dimension. Consciousness

then is not a representation of the body, as Damasio argues (1999), but rather a symbolization of lived subjectivity through the medium of value, meaning and self.

Arguably only the development of an embodied subjectivity allows for successfully coping with the contingent world. For every agent, reality unfolds into a large range of unforeseen events. It is not possible to program an agent according to this virtually endless wealth of reality. The only way to cope seems to assess what is good and what is a nuisance. This assessment is done by subjectively experiencing its meaning in relation to the continued realization of the living. Here it seems that Ockham's razor cuts better for the hermeneutic standpoint advanced in this chapter than for the cognitivist one in biology. We seem to have to give up the representationist paradigm on any level of organism, and not just in the explanation of how our big brains are working. The continuous staggering of strong Artificial Life is probably due to its detrimental adherence to the representational paradigm, and, until today, to the failure to take embodied subjectivity sufficiently into account (see e.g. Marvin Minsky's proposal "Once more with feeling", Gefter 2007).

To weigh up the benefits of subjective experience as a guideline, consider inborn behaviour. The classical (representational) approach claims that an organism stores each action and the stimuli concerned in some kind of neuronal memory. This means a huge bulk of information must be prestored, as well as constraining behaviour to the situational landscape it has been designed for. Our new perspective allows that there exist rather narrowly delineated algorithms of inborn behaviour, and those act mainly to maintain the integrity of the organism. Coping with the world means here that the organism acts due to the subjective urge to unfold and to protect its integrity (i.e. light feels good; sweetness feels good; a warm embrace feels good...). The behavioural patterns related to that follow from the inner organization of the living being and must not be independently encoded. The right behaviour then emerges all by itself in a self-organizing way. It shows a form of exploratory behaviour—in the same way that the capillary systems in a vertebrate's body do not grow according to a genetic plan but according to the need for tissues to be sustained with oxygen. (For more discussion of the emerging self-organizational picture of development see Kirschner and Gerhart 2005; Edelman and Tononi 1995). The hermeneutic explanation of coping has many advantages over the cognitivist one. It is universally applicable in every surrounding, it demands minimal storage of predetermined information, and it can be changed by very few mutations.

The core self is as immaterial as the power which brings forth the cell's coherence. This power is no additional force which Newton overlooked and which we now have to insert in our physical calculations as another causal factor. It is not the mechanistic *vis vitalis* of the vitalists, as seen for example in the works of the German researcher Hans Driesch. It is no dualist mind coming from outside and guiding the brain via quantum interactions, for example by collapsing the Schrödinger wavefunction, as has been suggested in slightly different forms by thinkers from Popper and Eccles (1977) to Penrose (1994). (For a detailed discussion see Chalmers 1996.)

Nonetheless this force of coherence is no illusion, as other contemporary authors still hold. On the contrary: the core self is the other, the "inner" side of metabolism without which it would lose its existence. It is the "right" side of metabolism (cf. Ruyer 1977 for the ontology of "right" (i.e. experienced) and "reverse" (i.e. third

person) perspectives). The core self opens the ordering perspective, the standpoint of being concerned. This standpoint is genuinely hermeneutical. It does not represent the body in the way in which the master display of a power station symbolizes how much fuel is burnt, how big the energy output is and whether there are any alerts, but rather it is the translation of body into subjective meaning.

The hermeneutics of subjectivity is the only scale in which what is relevant for a living being can be expressed. It is the fitting way to refer to a life process that unfolds, to a poiesis of auto-construction and auto-enhancement that succeeds. Subjective value is the common language of all cells and all organisms, a language of poietics and of poesy. Only decisions taken in this language can have consequences in the world, being retranslated by the body into muscular tonus, tissue tensions and synaptic coherence. This argument reminds us how an artwork, which is also matter and idea, or meaning, at once transmits its power by an expressive (or even, synecdochal) gesture.

According to Panksepp we have to follow this paradigm if we want to explain the “lingua franca” of intra- and inter-organic communication. For Panksepp, neuronal impulses create expressive forms or, as Susanne Langer (1953) would have it, forms with vital import. The aroused states of nervous cells and brain regions do not engender subjective propositions by transforming raw data into a digital code as a computer would do. The core self does not represent, it symbolizes. It does not exhibit in a one-to-one-style but it translates. To achieve this translation it tends to invent exaggerated expressions, creative solutions, hermeneutic enigmas. This biological idea dovetails well with the massive evidence of human cultural expression—as, in respect of human subjectivity at least, the poetic works and psychological insights of ages have shown. The core of feeling subjectivity is poiesis and its appearance is to be understood in poetic terms.

The hermeneutic approach to biology permits us to fill an old idea with new empirical validity: to regard ourselves as a living being in which nature’s subjectivity gains its own particular voice. We share the general organic subjectivity, but we can also communicate it, express it, and make it the foundation of a new chain of poiesis, which is less autopoietic than poetic. The particular quality which gives us this possibility of speech in a large sense, of semiotic freedom in culture, can no longer be regarded as something which separates us from nature. That which gives us the most human of traits is not a *differentia specifica*, but rather the paradigm of the living, and so the direct consequence of the *genus communis*. We no longer stand separate from creation, but rather are situated at its centre. We speak and understand the “lingua franca” of subjective meanings, too. We are a part of this language. We are, to use Gerard Manley Hopkins’ (2009) insightful expression, “world inscape”: “outside” and “inside” at the same time.

It is our body that consents to the fact that words can make us shiver and that imagined possibilities can make us run away. It is our flesh that brings forth subjective reality. Therefore not only is our subjectivity intimately entangled with our body, but so too is culture. Culture, the characteristic of our species, with which we most emphatically identify, actually does not stand alone but is interwoven with innumerable ways of organic feeling. Any contact with the surrounding world is an act of bodily imagination. A pointed word can hurt as acutely as a sharpened knife. Both protrude into the inner circle of existential closure which an organic being

intends to maintain. Both threaten its integrity. It is exactly for that reason we call a hurtful comment “sharp”: seen from the viewpoint of life words too cut an existential lattice. Our embodied perception transforms both the destructive word and the dangerous knife into that universal currency of experience which is valid in all provinces of the domain of life: the meaning for sustained realization of the living. Our language reflects the ecology of those associations. Its images do not observe the logic of space-time relationships between objects; rather they obey a logic of embodiment. Only because this is the case are poets able to explore within language our subjective feelings.

The ideas I have developed so far lead to a radical consequence, in that the mind-body problem seems to be overcome semiotically. The correspondence between mind (“feeling”) and body is itself already a symbolic relationship. “Feeling”—or the interior subjective perspective—can be read, because meaning and value become visible in the body as correlates of the interior perspective. This is reminiscent of Ernst Cassirer’s description of the relationship between symbolic thinking and culture: “The relation between body and soul represents the archetype and first model for a genuinely symbolical relation.... Here neither an inside nor an outside is at the origin, neither a before nor an afterwards, a causing force or a caused effect” (Cassirer 1977–1982, vol. 3: 117; my translation).

If we take nature as an assembly of bodies and the body as a part of nature, then we can extend this finding. Then “soul” in Cassirer’s sense, or “subjective feel” in Chalmers’, stretches out as the whole of animate nature lying before us. Nature thus is the outside of an organic inside, hence it is also our inside turned out; its expression is our intentionality. At the same time, from the expressiveness lying before me another inside can be experienced as an outside, and a subjective experience of the other, which is no different from me in its basic situation, becomes aesthetically transparent. And only in that way does subjectivity become real: the inside, or feeling, is possible only as the cognitive or behavioural dimension of an outside, of an embodied form. Both are fundamentally the same, in the sense that they form the matrix of one biological individuality.

These findings let us see our relationship to external nature in a different light. If we stand in a metabolic and semiotic continuum with the remainder of life then mind, which is the symbolic expression of this continuing subject-body, does not only encompass the meaning of processes that go on in the individual alone. Rather, it always reflects the meaning of being-a-part-of-the-world, and with this, the meaning of social relationships and the significance of the state of the natural environment, which in a very strong sense is our “superorganismic” niche.

Several different lines of thought start from these ideas. The symbolic conception of mind can help us to better understand social phenomena and cultural processes (both micro, in small groups, and probably also macro, in big or even global communities). They can provide a pathway for further examination of certain “dispositions” and fashions beyond the structuralist idea that words and common discourses alone structure experience. If “inside” is symbolic of “outside”, and “outside” already consists of an interaction of many different other selves, then we have a semiotic layer emerging which is much stronger than mere discourse – and much more related to biological world-making, too.

Another point should also be noted. If we speak of selves whose meaningful experiences become external influences to other selves and hence become part of their internal mirroring, we must clearly realize that the classical separation between agency and body is broken down empirically. Agents act according to their “inner” perspective and thus become real obstacles in the way of others. The world truly seems to be a mix, or a hybrid, as Latour (1991) would have it, of subjectivity and materiality. “Inside” is never far away. (For an enlarged discussion of the failure of neo-Darwinism and Evolutionary Psychology to purge biology of agency, and thereby paradoxically reintroducing biological agency in a strong sense, see Weber 2007b.)

Still another track leads to the difficult topic of environmental thinking. If our being is always intertwined with environment, then the resulting symbolical self cannot be separated from the remainder of nature. In that sense we become what we do to our (wild) environment. This relationship has been somewhat underestimated in the predominant dualist framework for addressing the relationship between man and nature and the ecological crisis. In the concluding section let us elaborate further on that crucial notion.

From the Hermeneutics of Organism to the Meaning of Nature

Today, many scientists agree that the fact that we are animals specifies our perception in such a fundamental way that we cannot change much about it. We do not experience the world primarily with our mind but with our senses, and we experience it as meaning. The discovery of the fundamentally semiotic or linguistic nature of our experience has been one of the major achievements in philosophy of the twentieth century. Mind is meaning as well. But this semiotic or linguistic turn considered language in the positivistic fashion of a rational – or less rational, but still binary—system of arbitrary signs. It rarely thought about the possibility that meaning might not only be derived from the differential values of purely mental signs, but that it could be grounded in embodied semiosis. We can see immediately that this makes all the difference. In structural philosophy, there is no connection between mind (as sign system) and body.

In the broader hermeneutic picture that I have tried to sketch here, however, human semiosis is linked to a general tendency of the biosphere to become semiotically transparent. It is linked to the hermeneutic character of life, and hence is situated at the heart of living nature. This difference is crucial for our self-understanding, for our understanding of life and of the role we are assuming in it. As we will see below, not only our theoretical approach to nature but also the practical steps we take towards identifying with it and preserving it are dependent on the stance we take here.

What is the picture that emerges if we do not follow the semiological reduction to binary sign systems, but rather try to cling to our idea of hermeneutic embodiment? First, we can give a diagnosis overwhelming in its cultural scope: human beings think in symbols and metaphors. Nature has been man’s prime cultural obsession for one million years. If we look at the archaic and indigenous cultures of history and of the few remaining islands of tribal culture, we must admit that here culture and

society are conceived nearly exclusively in natural terms. This finding is what inspired the (wrong, but characteristic) term “animism”: archaic descriptions of cosmos teem with life. But throughout our western culture too nature is the one deep undercurrent, manifesting itself for example in literary symbols, pictorial styles, and architectural principles. Simon Schama (1996: 27) observes that the “Cultural habits of mankind have always allowed for sacred nature... All our landscapes and landscape experiences... in reality carry the stamp of our obstinate and inexorable obsessions.”

The critical stream in the humanities has always been struggling to engage with these deep obsessions. The evolutionary approach in biology on the other hand has left no room for a hermeneutic view in its own right, regarding the experience of being emotionally close to nature rather as an epiphenomenon, a purely functional behaviour that favours enhanced offspring frequency. The biophilia hypothesis about our evolutionary-based intrinsic need for wild nature which Wilson (1984) has developed is an interesting exception to the general meaning-blindness of both science and the humanities. What Wilson really meant by biophilia, however, might only become fully plausible if re-read in the light of a hermeneutic biological position.

The view of biological hermeneutics I propose and develop in this chapter is able to connect those deep human experiences and their related cultural contexts with a scientific understanding of life. Within nature, those values and meanings that the life process produces manifest themselves as vital forms. They are observable by the senses. In the bodies of other living beings existential experiences such as abundance and threat, prosperity and hunger, death and birth are not hidden but visible. They are manifest in the appearance of other organisms. Only in the light of a general hermeneutics of the living we are able to set down a position which is able to include the cultural and the organic approach. The argument might run as follows: to fully experience the symbolic and experiential side of our beings and to integrate it into our personalities we are dependent on the presence of nature, which acts like a symbolic mirror. We gather food for our thoughts and mental concepts from the natural world. We transform plants and animals into intellectual symbols according to their real—or presumably real—qualities: the snake, the rose, the tree are examples for a host of powerful organic images that recur in art, in myth, and in other cultural forms throughout human history. These images seem to have a deep connection to the cultural subconscious. In their transformations we recognize ourselves.

Nature hence embodies what we are, too. It is the living mirror of our emotions and our mental concepts. Nature plays such a grand role in cultural traditions for this reason. Trees, for example, qualify as symbols for life because in our experience they really are life. After the symbolic death in winter they burst into green again, they grow, bloom and bear fruit, without any intervention whatsoever from our side. Productivity, innovation, harmony, but also decay and failure happen not only to us and our projects but to all of nature. The elements’ powers, the becoming and vanishing of other beings, the alternation of light and dark embody the processes that occur in our own inner landscape.

In the bodies of other beings we see how the same powers that we identify from our own embodied experience become form. We only know these powers from the

“inside”. We cannot understand them in an objectified way except in the bodies of other beings. Take a flower, for example. In its splendour, great or small, the happiness of all beginning, of any unprecedented unfolding, untouched and bright as untrodden snow, becomes real. By seeing and touching the flower, which is another organic being, I can grasp these subjective-emotive aspects in an objective fashion. Nature is the looking glass in which we can see expressed what we are ourselves. In a living tree, for example, we can experience forces which we “know” from ourselves—not in conceptual terms, but as “vital import” (Langer 1953). In the knotty oak, in the flowing sea of grass, lie as many layers of experience as in myself feeling my strength or my melancholy.

In this way I am able to understand my own beginning, my own hope, my own fresh starting as a facet of more general instances of life. I partake in a general condition of life. We can call it “*conditio vitae*”—in contrast to the term “*conditio humana*” which has been coined exclusively for the human situation. In the human condition everybody is confronted with a situation he is “thrown” into and cannot understand. In the “*conditio vitae*” the organic reality links us to every being and to every other living being’s sense. We are brothers and sisters to everything which experiences hermeneutically and which hence is alive. We share, on an empirically biological level; we are part of a greater connectedness, of a living cosmos, subject to a general principle of life which carries us over episodes of individual loss. We are no longer only “thrown into” isolation, as in the human condition, but also “supported” by a more than human life.

Only in the mirror of other life are we able to understand our own lives. Only in the eyes of the other can we become ourselves. We need the regard of the most unknown. Only it can release those layers of feeling in ourselves that otherwise would be locked forever. We need the experience that an inside stands in front of us, displaying itself as a fragile body. We need other organisms, because they are what we are, but they are that hidden part of us which we cannot see because we are it and we see with it. Viewed in this light other beings are the blind spot of our self-understanding.

This might give us a crucial hint about the import of nature, of the presence of living forms that have become and not been made. I have argued above that natural forms are symbols of our own constitution as organic beings, and that other beings hence are symbolically pregnant in their very essence. But now we might vary that statement to include more depth. We can observe, in most cultures, and even in our own with its sad record of neglecting non-human beings, a deep fascination with anything natural. When we accept that our own subjectivity-as-becoming is always a primordial relation, that subjectivity itself is a dialectics differentiating with a very ephemeral hand the ever-changing demarcation line and trading schemata between self and other, then we find in animate nature not just a non-discursive symbology of our own. Instead, nature, and particularly animals, are paradigms of the relation of the-self-in-the-other, and thus our experience of them might be the archetype of relatedness as such.

But still: whilst being embodied, whilst being striving beings in the world, plants and animals are at the same time not just abstract models for relations. They are closed in themselves, as any living being is, and in the middle of their accessibility they are absolutely unfathomable. Not alien, but without limits. They are exactly

what Goethe referred to as “Urphänomen”: the phenomenon which at the same time is its explication, but only as a phenomenon, not as explanation, or algorithm. In wild nature’s presence, be it an organism as taxonomically close to us as an ape, or as seemingly infinitely distant as a tadpole, we find ourselves amongst speechless creation. The animal’s look upon us is woven from the entanglement of the most intimately known with the most alien.

The distinctness of many of our experiential categories might only be possible because in wild nature, in *natura naturans*, there is this form of subjectivity untouched by man, which has brought us forth and which still guides us as to how to confront our own embodied existence. Here seems to lie a path where dualism can be healed. The deep cleft which has opened up between us and other beings, between the world as we experience it and the world as we describe it, closes again, and for the first time for a long period we are welcome. Plato had suggested that for every term, be it as abstract as can be, there was an *eidos*, an archetype in the empire of ideas. Certainly, Plato was not completely clear at this point. The empire of ideas does not lie beyond, in an ideal world, but is anchored here, in the bodies of plants and animals, in the buzz of the bees and the shape of the circling raven.

References

- Bauer, J. (2008). *Das kooperative Gen*. Hamburg: Hoffmann und Campe.
- Bryant, John. (2006). To fight some other world. In John Bryant, Mary Bercaw Edwards, & Timothy Marr (Eds.), *Ungraspable phantom: essays on Moby Dick* (p. x). Kent: Kent State University Press.
- Carroll, Sean B. (2005). *Endless forms most beautiful. The new science of Evo Devo and the making of the animal kingdom*. New York and London: Norton.
- Cassirer, Ernst. (1977–1982). *Philosophie der symbolischen Formen*. Darmstadt: Wissenschaftliche Buchgesellschaft.
- Chalmers, D. (1996). *The Conscious Mind. In search of a fundamental theory*. Oxford: Oxford University Press.
- Damasio, A. R. (1999). *The Feeling of What Happens: Body and Emotion in the Making of Consciousness*. New York: Harcourt Brace.
- Deleuze, G. (1988). *Le Pli*. Paris: Minuit.
- Edelman, G. M., & Tononi, G. (1995). Neural Darwinism: the brain as a selectional system. In J. Cornwell (Ed.), *Nature's imagination* (pp. 78–100). Oxford: Oxford University Press.
- Feyerabend, P. (2009). *Naturphilosophie*. Frankfurt am Main: Suhrkamp.
- Gefter, Amanda (2007). “Once more with feeling”. Interview with Marvin Minsky. *New Scientist* 2592
- Turnbaugh, Peter J., Ley, Ruth E., Hamady, Micah, Fraser-Liggett, Claire M., Knight, Rob, & Gordon, Jeffrey I. (2007). The Human Microbiome Project. *Nature*, 7164, 804–812.
- Hoffmeyer, J. (1992). Some Semiotic Aspects of the Psycho-Physical Relation: The Endo-Exosemiotic Boundary. In Sebeok & Umiker-Sebeok (Eds.), *Biosemiotics: The Semiotic Web 1991* (pp. 101–123). Berlin: Mouton de Gruyter.
- Hoffmeyer, J. (2006). Genes, Development, and Semiosis. In Neumann-Held Eva & Rehmann-Sutter Christoph (Eds.), *Genes in Development. Re-reading the molecular paradigm* (pp. 152–174). Durham and London: Duke University Press.
- Hopkins, G. M. (2009). *Journal. Translated by Peter Waterhouse*. Salzburg: Jung und Jung.
- Jablonka, Eva, & Lamb, Marion. (2005). *Evolution in Four Dimensions. Genetic, Epigenetic, Behavioral, and Symbolic Variation in the History of Life*. Cambridge, Mass. and London: MIT Press.
- Kauffman, S. (2000). *Investigations*. Oxford: Oxford University Press.
- Kauffman, S. (2008). *Reinventing the Sacred*. New York: Basic Books.
- Keller, Elisabeth Fox. (2002). *Making sense of life. Explaining biological development with models, metaphors and machines*. Cambridge: Harvard University Press.
- Kirschner, M., Gerhart, J., & Mitchison, T. (2000). Molecular ‘Vitalism’. *Cell*, 100, 79–88.

- Kirschner, M. W., & Gerhart, J. C. (2005). *The Plausibility of Life. Recolving Darwin's Dilemma*. New Haven: Yale University Press.
- Kulesa, P. M., & Bonner-Fraser, M. (2000). In Ovo Time-Lapse Analysis after Dorsal Neural Tube Ablation shows rerouting of chick hindbrain neural crest. *Development*, 127(13), 2843–2852.
- Langer, S. K. (1953). *Feeling and Form*. New York: Scribner.
- Latour, B. (1991). *We have never been modern*. Cambridge: Harvard University Press.
- Ley, Ruth E., Lozupone, Catherine A., Hamady, Micah, Knight, Rob, & Gordon, Jeffrey I. (2008). Worlds within worlds: evolution of the vertebrate gut microbiota. *Nature Reviews*, 6, 776–788.
- Libet, B. (1985). Unconscious cerebral initiative and the role of conscious will in voluntary action. *Behavioral and brain sciences*, 8(44), 529–566.
- Meltzoff, Andrew N. (2005). Imitation and Other Minds: The 'Like Me' Hypothesis. In S. Hurley & N. Chater (Eds.), *Perspectives on Imitation: From Neuroscience to Social Science, Vol. 2* (pp. 55–77). Cambridge: MIT Press.
- Meltzoff, A. N., & Moore, M. K. (1995). Infants' understanding of people and things: From body imitation to folk psychology. In J. Bermúdez, A. Marcel, & N. Eilan (Eds.), *The body and the self* (pp. 43–69). Cambridge: MIT Press.
- Olbrich, Ehrhard. (2009). Bausteine einer Mensch-Tier-Beziehung. In Carola Otterstedt & Michael Rosenberger (Eds.), *Gefährten—Konkurrenten—Verwandte. Die Mensch-Tier-Beziehung im wissenschaftlichen Diskurs*. Göttingen: Vandenhoeck und Ruprecht.
- Panksepp, Jaak (2001). "Affective Neuroscience: Possible consilience between psychoanalysis and brain research". Les états généraux de la psychanalyse. Online at: <http://www.etatsgeneraux-psychanalyse.net/archives/texte215.html> (retrieved February 12th 2009).
- Penrose, R. (1994). *Shadows of the mind*. Oxford: Oxford University Press.
- Popper, Karl, & Eccles, John. (1977). *The Self and its brain: An argument for interactionism*. Berlin and New York: Springer.
- Powell, D. (2009). Treat a female rat like a male and its brain changes. *New Scientist*, 2690, 8.
- Ruyer, R. (1977). *La Gnose de Princeton. Des savants à la recherche d'une religion*. Paris: Hachette.
- Schama, S. (1996). *Landscape and Memory*. New York: Vintage.
- Varela, F. J. (1997). Patterns of Life: Intertwining Identity and Cognition. *Brain and Cognition*, 34, 72–87.
- Varela, F. J., et al. (1991). *The Embodied Mind: Cognitive Science and Human Experience*. Cambridge: MIT Press.
- Von Dassow, G., Meir, E., Munro, E. H., & Odell, G. M. (2000). The segment polarity network is a robust developmental module. *Nature*, 406, 188–192.
- Weber, Andreas. (2007a). *Alles fühlt. Mensch, Natur und die Revolution der Lebenswissenschaften*. Berlin: Berlin-Verlag.
- Weber, A. (2007b). The wake of consilience produces monsters. Evolutionary Psychology, Social Construction, and a Biosemiotic Proposal for Symmetry. In M. Barbieri (Ed.), *Biosemiotic Research Trends* (pp. 241–254). New York: Hauppauge.
- Weber, A., & Varela, F. J. (2002). Life after Kant. Natural purposes and the autopoietic foundations of biological individuality. *Phenomenology & the Cognitive Sciences*, 1, 97–125.
- Wilson, E. O. (1984). *Biophilia*. Cambridge: Harvard University Press.