

# Cybersemiotic Pragmatism and Constructivism

Søren Brier • Copenhagen Business School • sb.ikk@cbs.dk

**> Context** • Radical constructivism claims that we have no final truth criteria for establishing one ontology over another. This leaves us with the question of how we can come to know anything in a viable manner. According to von Glasersfeld, radical constructivism is a theory of knowledge rather than a philosophy of the world in itself because we do not have access to a human-independent world. He considers knowledge as the ordering of experience to cope with situations in a satisfactory way. **> Problem** • Von Foerster and Krippendorff show that the central goal of a constructivist theory of knowing must be to find a way of putting the knower into a known that is constructed so as to keep the knower, as well as the knowing process, viable in practice. **> Method** • The conceptual and philosophical analysis of present theories and their necessary prerequisites suggests that such foundation for viable knowing can be built on the analysis of what the ontological prerequisites are for establishing viable observing, cognition, communication and observer-communicators, and communication media and vehicles. **> Results** • The moment an observer chooses to accept his/her own embodied conscious presence in this world as well as language, he/she must accept other humans as partly independently existing conversation partners; if knowledge and knowing has to make sense, he/she must also accept as prerequisites for our observation and conversation a pre-linguistic reality from which our bodies come and which our conversation is often about. Furthermore, we can no longer claim that there is a reality that we do not know anything about: From being here in conversation, we know that the world can produce more or less stable embodied consciousnesses that can exchange and construct conceptual meanings through embodied conversations and actions that last over time and exist in space-time and mind, and are correlated to our embodied practices. We can also see that our communication works through signs for all living systems as well as in human language, understood as a structured and progressively developed system of communication. The prerequisite for this social semiotic production of meaning is the fourfold “semiotic star of cybersemiotics,” which includes at least four different worlds: our bodies, the combination of society, culture and language, our consciousness, and also an outer nature. **> Implications** • The semiotic star in cybersemiotics claims that the internal subjective, the intersubjective linguistic, our living bodies, and nature are irreducible and equally necessary as epistemological prerequisites for knowing. The viable reality of any of them cannot be denied without self-refuting paradoxes. There is an obvious connectedness between the four worlds, which Peirce called “synechism.” It also points to Peirce’s conclusion that logic and rationality are part of the process of semiosis, and that meaning in the form of semiosis is a fundamental aspect of reality, not just a construction in our heads. **> Key words** • Ontology, embodiment, philosophy of observing, second-order cybernetics, autopoiesis, semiotics, language, phenomenology, radical constructivism, Husserl, C. S. Peirce, Spencer-Brown.

“Every attempt to understand anything – every research – supposes, or at least hopes, that the very objects of study themselves are subject to a logic more or less identical with that which we employ. ... Whatever else may be said for or against that hypothesis, that which we of these times ought to try is rather the hypothesis that the logic of the universe is one to which our own aspires ...”  
(Peirce, CP 6.189)

“...a universe comes into being when a space is severed or taken apart ... By tracing the way we represent such a severance, we can begin to reconstruct, with an accuracy and coverage that appear almost uncanny, the basic forms underlying linguistic, mathematical, physical, and biological science, and can begin to see how the familiar laws of our own experience follow inexorably from the original act of severance. The act is itself already remembered, even if unconsciously, as our first attempt to distinguish different things in a world...”  
(Spencer-Brown 1969: V)

## Introduction

I take my departure point in Ernst von Glasersfeld’s epistemology of radical constructivism in order to show that it can only work on the assumption of a realistic ontology, although not one that is mechanistic or that has a simple truth function. According to von Glasersfeld, radical constructivism is an experiential theory of knowing that does not in any way depend on ontological postulates or any kind of theory of truth. Our world is not one objective world, but is the subject’s way of ordering his or her experiences. Von Glasersfeld writes:

“to have ‘learned’ means to have drawn conclusions from experience and to act accordingly. To act accordingly, of course, implies that there are certain experiences which one would like to repeat rather than others which one would like to avoid. The expectation that any such control over experience can be gained must be founded on the assumptions that: (1) some regularities can be detected in the experiential sequence; and (2) future experience will, at least to some extent, conform to these regularities. These assumptions, as David Hume showed, are prerequisites for the inductive process and the knowledge that results from it.” (Glaserfeld 2007: 11)

Von Glaserfeld underlines that knowledge is not experience itself but an ordering of it. “...humans can only know what humans can construct.” (Glaserfeld 2007: 67). Actually, cognition is a segmentation of our experiences into what Gregory Bateson (1973) calls “a difference that makes a difference” in order to adapt. But this adaptation is not to an outer world but only to experiences. Adaptation is not becoming like the world, it is only a process of finding a viable way to live with one’s own experiences. Thus the scientific method is only about organizing experiences (Glaserfeld 2007: 36). It is not about ordering the relation between an embodied subject and an environment. Though von Glaserfeld now and then refers to living beings or systems (Glaserfeld 2007) and to Maturana’s theory of autopoiesis, he does not seem to find it necessary to have a theory of the ontology of the body or the embodied mind. He does write of subjects and subjectivities, but he considers the theory of other subjects a problematical ontological construction, and therefore also considers the whole concept of intersubjectivity and its influence on the structure and processes of mind as being a free construction with no real ontological consequences. He writes.

“From the constructivist perspective, however, even the notion of intersubjectivity is problematic. The reason is simply that, given a theory of knowledge that claims the subject’s idea (*Vorstellung*) of the world to be the subject’s own construction, it is not obvious how such an idea of the world should come to incorporate the notion of *Others* in the sense of *other cognizing organisms* who may construct their own ‘idea of the world’....

Needless to say, the interaction with these *Others* will tend to be more and more of the kind we call ‘linguistic.’ This kind of interaction is, in fact, based on the assumption of analogous operative, conceptual processes in the users of the particular language.” (Glaserfeld 2007: 27)

I think that we can develop the constructivist view much further than von Glaserfeld does, starting from the experience that we find ourselves as embodied sensing, experiencing and thinking beings ordering our experiences in language in social interaction with other embodied subjects. Though there might be only one conscious being making up the world when we consider the deepest transcendent level of reality, I see no reason to doubt the reality of language and other subjects when we consider the immanent level of being or existence. Though I will go through second-order cybernetic and autopoietic as well as phenomenological thinkers, my guiding star will be Charles Sanders Peirce’s “semiotic pragmatism,” where, through an evolutionary objective idealism and a view of emptiness as the ultimate reality, he develops a constructivism on a realistic semiotic basis. The common thread in my argument will be that constructivism and realism, though in an evolutionary semiotic version, are necessary complementary aspects needed to produce a full philosophy and theory of science and knowledge.

## Peirce’s phaneroscopic pragmatism

Being unsatisfied with the way in which other thinkers such as William James and John Dewey had developed – the so-called American pragmatism – he attempted in the last part of his life to integrate all the developments of his architectonic semiotic philosophy that he had made in earlier years to a new integrative level, which he called “pragmatism.” One of the underlying causes of this change was Peirce’s adoption of a more sophisticated approach to the reality of modal notions such as necessity and possibility. He had changed his view from a nominalist one to being a realist about possibilities, or “would-bes” as he called them. As a nominalist, Peirce considered any

theory that does not take the real separate existence of laws, generalities, possibilities, etc. seriously, which would include radical constructivism. Peirce thus changed to a realistic view of possibilities, or “would-bes,” as being independently real in around 1896/97<sup>1</sup>. Real possibilities are the denial of necessity, and they are vague, like any other contradiction of the general (universals) in the deterministic form that is the core thinking of mechanism. What came to distinguish Peirce’s pragmatism from William James’ pragmatism was furthermore that, where James looked to practical consequences for the individual, Peirce looked at the establishment of habit as well as possibilities across persons and communities. The sense of community is essential for the production of scientific knowledge as well as for general religious knowledge. As we shall discuss the problems of metaphysical foundations for various kinds of constructivism, it is also important to point out that at this stage in his theory development, Peirce also needed to adjust his theory to the metaphysics he had developed. By the turn of the century, Peirce had developed fully the role of metaphysics in his system. He needed therefore to reconstruct it as a meaningful science in his semiotic pragmatism. From 1905 on, he used the term “pragmatism.” It is this metaphysical turn that is the focus

1 | As Atkin (2005) wrote, “In his later account of pragmatism, Peirce takes subjunctive conditionals, rather than indicative conditionals, to form the list of conditional propositions that constitute the meaning of our concepts. For instance, in the 1878 account, conditional statements generated for propositions like ‘vinegar is diluted acetic acid’ would include, ‘If litmus paper is dipped into it then it will turn that paper red.’ This is an indicative conditional, expressing what *will* happen... Peirce draws a distinction between ‘real’ and ‘ideal’ experience. The former is what we would normally think of as experience through the senses. The later involves diagrammatic reasoning, employed by mathematicians for instance. For Peirce, ‘ideal’ experience involves performing transformations and operations upon diagrams, and ‘experiencing,’ or observing, the result. Algebraic equations and the transformations we perform upon them, for instance, count as diagrammatic or ‘ideal’ experiences.” See also Stjernfelt (2007: 39–47)

the present investigation of the problems in constructivist philosophy.<sup>2</sup>

We can, so to say, reflect back on what the prerequisites must be for us to find ourselves using language or, more generally, signs in ordering our experiences in cooperation with what we conceive to be other linguistically competent and embodied subjects relating to what appears to be a common world. Peirce called his semiotic philosophy, which is still an experiential or phenomenological process philosophy of knowing, “phaneroscopy.” Its foundation and idea of knowing as a reflective ordering of our basic experience are laid out in the following passage:

“No thought in itself, ... no feeling in itself, contains any others, but is absolutely simple and unanalyzable; ... Whatever is wholly incomparable with anything else is wholly inexplicable, because explanation consists in bringing things under general laws or under natural classes. Hence every thought, in so far as it is a feeling of a peculiar sort, is simply an ultimate, inexplicable fact. Yet this does not conflict with my postulate that that fact should be allowed to stand as inexplicable; for, on the one hand, we never can think, ‘This is present to me,’ since, before we have time to make the reflection, the sensation is past, and, on the other hand, when once past, we can never bring back the quality of the feeling as it was in and for itself, or know what it was like in itself, or even discover the existence of this quality except by a corollary from our general theory of ourselves, and then not in its idiosyncrasy, but only as something present. But, as something present, feelings are all alike and require no explanation, since they contain only what is universal. So that nothing which we can truly predicate of feelings is left inexplicable, but only something which we cannot reflectively know. So that we do not fall into the contradiction of making the Mediate immediable. Finally, no present actual thought (which is a mere feeling) has any meaning, any intellectual value; for this lies not in what is actually thought, but in what this thought may be connected with in representation by subsequent thoughts; so that the meaning of a thought is altogether something virtual. ... At no one instant

2 | In contrast to Stjernfelt’s (2007: 42–43, and notes) critique of Peirce’s objective and evolutionary idealism as disturbing his progress in understanding the reality of possibilities and an ontology of relations, I find it essential and necessary.

in my state of mind is there cognition or representation, but in the relation of my states of mind at different instants there is. In short, the Immediate (and therefore in itself unsusceptible of mediation – the Unanalyzable, the Inexplicable, the Unintellectual) runs in a continuous stream through our lives; it is the sum total of consciousness, whose mediation, which is the continuity of it, is brought about by a real effective force behind consciousness.” (Peirce CP 5. 289).

Thus von Glasersfeld and Peirce agree that cognition is the intelligent ordering of experience, and experience is the basis of our search for knowledge in order to survive and live a good life. But to Peirce, this ordering is not internal as thoughts are not so much in us as we are in thoughts. As Peirce wrote:

“Accordingly, just as we say that a body is in motion, and not that motion is in a body, we ought to say that we are in thought, and not that thoughts are in us.” (Peirce, CP 2: 241, 227, 227n)

As such, Peirce agrees with Bateson’s idea that the mind “inside the head” is only a part of a bigger processual mind (Bateson 1980; Bateson & Bateson 2005). Thus the embodied subject is in the world and not outside. Observers and environment together construct a reality. This has been an observation foundational to von Foerster’s second-order cybernetics, which we will take a closer look at here.

## Knower and knowing

In order to define our problem of what kind of ontological prerequisites observing implies, let us start with one of Heinz von Foerster’s ways of defining second-order cybernetics as arising from the necessity of any scientific theory that strives towards completeness:

“...what’s new of today’s cyberneticians? What is new is the profound insight that a brain is required to write a theory of a brain. From this follows that a theory of the brain, which has any aspirations for completeness, has to account for the writing of this theory. And even more fascinating, the writer of this theory has to account for her or himself. Translated into the domain of cy-

bernetics: the cybernetician, by entering his own domain, has to account for his or her own activity. Cybernetics then becomes cybernetics of cybernetics, or second-order cybernetics.” (Foerster 2003: 289)

This has basic methodological implications for all attempts to produce intersubjectively acceptable knowledge. As Klaus Krippendorff (1991) explains, many different kinds of constructivism (including Maturana and Varela’s “bring-forth-ism”) flourish within second-order cybernetics. Without having a preference for any of them, he summarizes the essential goal of second-order cybernetics and constructivism:

“The task of constructivism, as I see it, is to describe a system’s operation within its own domain of description and account for the constitution of its identity and the conditions of its continued persistence in its own terms. Said differently, constructivists need to find a way of putting the knower into a known that is constructed so as to keep the knower viable in practice.” (Krippendorff 1991)

But how can we find a way to put the knower into a known that is constructed so as to keep the knower viable? It is both an ontological and an epistemological problem that is now raised to a new level as the dualistic and mechanistic world view is abandoned and knower and known are placed in the same world.

For me, it is difficult to see how constructivism can live up to this. All it has is observation and structuring of observation. But how is that going to constitute its identity and its continued persistence, not to speak of arriving at a theory of the knower and knowing? One can hardly claim to make a paradigm without saying something about both and about how they are connected. I also find it problematic to give up any claims on truth as a selection criterion of theories, even though we know that we cannot prove any actual theory to be absolutely true.

Roy Bhaskar (1975), in his *A Realist Theory of Science*, called our theoretical constructs “transitive objects” and the real ones “intransitive.” In accordance with Peirce, he developed a position called “transcendental realism,” which he later changed to “critical realism.” He argued that the entities and

mechanisms constructed by science are not simply beings as they are for us, or beings in terms of our access to these beings. Bhaskar maintained that the intelligibility of science requires that mechanisms or entities constructed by science must be thought of as belonging to a world without humans and therefore being, actually, discoveries.

For Bhaskar, the existence of objects independently of humans is a *transcendental* condition (in the philosophical sense of Immanuel Kant) for science. Peirce, too, sees it necessary for any semiotics, and therefore natural language, on which mathematical sciences are based. In the end, for Peirce, a sign is what an object presupposes (Deely 1990). The way of signs leads everywhere in our mind as well as in culture and nature. Nature is full of – or as Peirce wrote, “per-fused” with – signs. Signs are the only way through which we can understand nature as well as ourselves and our culture. For Peirce, the universe is a great argument, and man’s subject is a symbol, and this is the connection between the two.

In this view, then, the reflection Krippendorff suggested for how to find a way of putting the knower into a known that is constructed so as to keep the knowers and their knowing viable in practice, is basic to all modern philosophy of science including all sorts of constructivism. There is an agreement that one cannot establish a scientific standpoint without a (second-order) reflection on (1) epistemology (concerning knowledge and truth), (2) ontology (concerning what has to be presumed about the world in order to consider the knowledge viable), and (3) axiology, or ethical and aesthetic values (concerning what kind of knowledge is worth pursuing in as far as it is supposed to contribute to “the good life,” what the good life is, and how we determine that). These are basically what Thomas Kuhn (1970) pointed out to be the most important ingredients of a paradigm that he specified as “the disciplinary matrix.” These three elements are partly interdependent and together they construct theories of knowing, reality and living and, as a consequence, of meaning and rationality. They compose the basic structure of philosophy. Bhaskar accepted this and, consequently, that the sciences are socially situated rather than socially determined! This view main-

tains the possibility for objective critique to motivate social change. Thus constructivism and realism do not have to be absolute opposites.

In the rest of the paper, I want to suggest another foundation called “cybersemiotics,” which can encompass both realism and constructivism in their non-radical forms. The foundation is built on the analysis of what the ontological prerequisites are for establishing viable observing and observers. I will first examine the relationship between constructivism and phenomenology in terms of Husserl’s, C.S. Peirce’s and Spencer-Brown’s respective philosophies. Discussing the perennial philosophy will lead to the insight that constructivism, too, has ontological requirements.

I will pose and try to answer three central questions regarding core constructivist notions, i.e., distinction-making and observing: (1) What is the nature of a distinction? (2) What is the ontology that observing requires? (3) What would a theory look like that claims that the observer arises in observing? As it will turn out, languaging, the starting point of Maturana’s theory, cannot arise in the individual observer as there are no private object worlds. I will argue that Luhmann was one of the cybernetic constructivists who took on board the consequences of but failed to define a theory of meaning that was compatible with systems theory. The importance of language and the nature of science are discussed further on. Finally, I claim that neither human beings nor their languaging and cognitive abilities nor autopoietic structures can exist without an environment filled with energy, order and material structure – a claim that also seems to be in agreement with an early paper of von Foerster’s. The paper concludes with the semiotic star, a fourfold concept illustrating the link between life, consciousness, energy, and meaning.

## Constructivism and phenomenology

Since Plato, philosophy has been defined as the general reflection on the true, the good and the beautiful. We inherited the faith in the existence of eternal and universally valid and therefore true knowl-

edge. Throughout history, religion, science and politics (or political ideologies) have competed about which of them could best define this true knowledge – and obtain the power connected with it. Rudolf Carnap’s early foundationalist version was based on the hope of finding a way to the truth of reality that would not involve religion, speculative metaphysics, subjective emotions or political ideology. Later, the social scientist, Otto Neurath, developed a more intersubjective version, of which he convinced Carnap, which was quite close to Karl Popper’s critical rationalism that appeared later, but still founded on a strictly physicalist and therefore behavioristic view (Oluffa Pedersen & Toft 2004). After Popper, only very few philosophers of science still have a naïvely *realistic* or even *physicalistic* ontology and, with that, a conviction that science is, step by step or stone by stone of facts, building a true model of the world.

For those who most vehemently object to a naïvely realist perspective, social and radical constructivism offer possible points of departure. Non-constructivists usually categorize constructivisms according to whether they are, on the one hand, epistemological or ontological and whether, on the other hand, they cover only society or also nature. Here I will only deal with a constructivism that both covers nature and science and is ontological, as it assumes that what we do when observing and thinking is to order our perception into a world, thus postulating “order” and “ordering processes” and that the stuff reality is built on is “perception.” This is called “phenomenalism,” just like Ernst Mach’s (1984) early version of what later led to logical positivism (Brier 2006). All we have is observing or sense perception, and following Occam’s razor, there is no reason to postulate a world in the form of a universe behind the observations understood as the causal reason for them, thereby turning the observations into representations, as the semiotic phenomenologist Peirce insists. As in Husserlian phenomenology, constructivism focuses on matter in itself, namely phenomena as they present themselves in our consciousness – the experienced phenomena, which is the only reality we know for sure! (Husserl 1997, 1999; Glasersfeld 2007) Thus phenomenology and constructivism share the belief that



the world is as we experience it because they assume the ontology that our perceptions are the world in itself. There is nothing behind observation that one can talk of, and that therefore can make any sense! Actually this is a kind of phenomenalism, so called by those realists who believe in a radically different ontology, where the real is what objectively causes the perception for the observers, and behind which subjects are postulated as the cause of observation. Both constructivists and most phenomenologists claim to be dealing only with observation, and say that the ideas of an objective world with objects and a subject behind observations (separated from the world in some way or the other) is a rationalistic and scientific construction. Descartes famously formulated such a dualistic rationalist realism, which phenomenologists and constructivists oppose.

There are at least two places from where one can start a constructivist paradigm: either from the single observer or from a group of observers communicating in language, as this seems to be a necessary prerequisite for making intersubjective knowledge.

Constructivist approaches such as autopoiesis theory and second-order cybernetics start with individual observers' observation. Applying Occam's razor, here the simplest ontology is solipsism: there is only observation or, more correctly, there is only me and my observation. Humberto Maturana (1981, 1983, 1988, 2000; Maturana & Varela 1980, 1986) uses it, and so did George Spencer-Brown (1972) and early Edmund Husserl (1931, 1970, 1997). The simplest way of observing – the minimum requirement – is to make distinctions, as Spencer-Brown wrote in his *Laws of Form* (1972). Also, Bateson (1973, 1980; Bateson & Bateson 2005) was known for writing that information is a difference that makes a difference, though Bateson never really started with first person consciousness. Neither did Maturana, who instead started with the living biological system. Von Foerster seems to base his theories only partially on a first person, experiencing consciousness. But that may be because these authors, in contrast to Husserl, never really took the trouble to describe in detail their paradigm of consciousness. Von Glasersfeld (2007) actually seems to be the only constructivist that comes close

to a phenomenological starting point. Neither von Foerster, nor Maturana or Bateson theorize about first person consciousness or a pure observing being. Thus, actually, we do not start with only an observer, but with observing as a cognitive process.

In the following I will explore the commonalities and differences between constructivism and phenomenology in greater detail on the bases of Husserl, Peirce, and Spencer-Brown.

### Husserl

Maturana's claim, "...an observer has no operational basis to make any statement or claim about objects, entities or relations as if they existed independently of what he or she does" (Maturana 1988b: 30) seems to be in agreement with both von Glasersfeld's radical constructivism and with early Husserl's phenomenology. Husserl tried to address that which appears in consciousness:

“Phenomenology is ... the theory of experiences in general, inclusive of all matters, whether real ... or intentional, given in experiences, and evidently discoverable in them. Pure phenomenology is accordingly the theory of the essence of 'pure phenomena', the phenomena of a 'pure consciousness' or of a pure 'ego': ... it takes all apperceptions and judgmental assertions, which point beyond what is given in adequate, purely immanent intuition, which point beyond the pure stream of consciousness, and treats them purely as the experiences they are in themselves: it subjects them to a purely immanent, purely descriptive examination into essence. This examination of essence is also pure in a second sense, in the sense of Ideation; this is an *a priori* examination in the true sense ... [not speaking] of psychological facts and laws in an 'objective' nature, only of pure possibilities and necessities, which belong to any form of the pure 'cogito' ...” (Husserl 1970: 859)

Only observers can describe and create what Husserl calls a “life world.” This world is defined in opposition to a claimed truth and reality of the physical universe giving origin to all sorts of real phenomena. However, in radical constructivism, phenomenology and autopoiesis theory, the phenomena or content of our world including things as well as people must arise from observation or rather the observation of observation in the form of their own description. Observ-

ers do not arise from an outer universe but from the foundational process of observation. This means that Maturana, von Glasersfeld and most phenomenologists agree with Immanuel Kant that outside observation, nothing can be said about a transcendental reality of the thing in itself. But that does not ruin Bhaskar's point where he agrees with Kant that transcendental reality seems to be a necessary prerequisite for science and the idea of truth. Kant claimed that some kind of categorical stability seems necessary – a standpoint that Peirce later renewed in the development of his three categories. It is necessary, even in the most radical process view to have some elements that stay the same and that are the basis of observation.

In his early period, Husserl (1931) tried to find “the thing in itself” in the basic structures of perception or observing. But he had to realize that this very Platonic project could not be carried out. In the rest of his life's work he attempted another way of carrying out an encompassing and consistent phenomenological philosophy, posthumously published as *Husserliana: Edmund Husserl – Gesammelte Werke*. Based on the analysis of this material, Dan Zahavi (2001) pointed out that an intersubjective transformation of transcendental philosophy can be found in Husserl's phenomenology. Husserl eventually came to believe that an analysis of transcendental intersubjectivity was fundamental for a phenomenological philosophy, and produced a radical and complex concept of intersubjectivity as a core concept of phenomenology. It seems that Husserl's focus on the reality of intersubjectivity was a point of divergence between phenomenology and constructivism.

### Peirce

In my opinion, neither constructivists nor phenomenologists have yet fully solved the problem of intersubjectivity and, by implication, the role of language and other persons' minds and bodies in the construction of intersubjectively communicated knowledge, because neither of them are in a position to say more about the ontological assumptions of how human consciousness is connected to the rest of the world. Peirce's phaneroscopy pretty much starts from the same grounds as constructivism and phenomenology:

“I use the word phaneron to mean all that is present to the mind in any sense or in any way whatsoever, regardless of whether it be fact or figment. I examine the phaneron and I endeavor to sort out its elements according to the complexity of their structure.” (CP 8.213, c.1905).

However, Peirce’s phaneroscopy differs from Husserl’s phenomenology as it assumes a monistic hylozoist’s theory of mind and matter as a continuum: in the beginning, mind is partly hidden inside matter. This seems more reasonable, simple and elegant than assuming two radically different qualities of being. He also realizes as phenomenology that we have to take seriously the observing and knowing ability of the human animal before it started making science. It is the prerequisite that we have to make clear before we can make any evaluation of scientific knowledge. Some of this investigation can use the methods of science, but some of it has to be a reflective philosophy of the kind that radical constructivism pursues. To Peirce, it is the study of sign and meaning making. Deely (1990) argued that Peircean semiotics is a perspective that arises from the attempt to make thematic a ground common to all methods or, one could say, before all methods. From within this point of view, it becomes clear that Peircean semiotics is the study of the action of signs. It is a cenoscopic science.

Peirce (CP 1.181) divided the sciences in three types: 1. A science of discovery, 2. A science of review, and 3. Practical sciences. It is within the sciences of discovery that we find the idea of “cenoscopy.” He has the following division: (1) Mathematics, understood as that science which draws necessary conclusions about hypothetical objects. (2) Cenoscopy, which he also calls primary philosophy, is about all positive phenomena in general, which confront a person at every waking moment. This is where he sees his phaneroscopy placed. Finally comes (3), Idioscopy or ideoscopic sciences, which is his name for the special or positive sciences. These are about special classes of positive phenomena. They have the purpose of discovering new phenomena through observation and experiments. This is the typical set up in natural sciences, trying to hold several factors stable in order to focus on one or two variables.

Thus cenoscopic science, with its philosophical reflections, precedes the special or idioscopic sciences and is the place from where their individual contributions to man’s knowledge of himself and the world should be evaluated and reflected upon. Thus here is a point where Peirce, Husserl and von Glasersfeld agree. Where they differ is where Pierce boldly carries out a philosophy with a full triadic metaphysics based on a non-dualistic view of mind and matter emerging out of his analysis of the phaneron:

“What I term phaneroscopy is that study which, supported by the direct observation of phanerons and generalizing its observations, signalizes several very broad classes of phanerons; describes the features of each; shows that although they are so inextricably mixed together that no one can be isolated, yet it is manifest that their characters are quite disparate; then proves, beyond question, that a certain very short list comprises all of these broadest categories of phanerons there are; and finally proceeds to the laborious and difficult task of enumerating the principal subdivisions of those categories.” (CP 1.286)

However, not all elements in the phaneron are being studied, only the elements that are indecomposable (CP 1.288). These indecomposable phaneroscopic elements exemplify the most basic universal categories. According to Peirce, the numbers of categories are three and only three (CP 1.418; 1.292).

“Of the three Universes of Experience familiar to us all, the first comprises all mere Ideas, those airy nothings to which the mind of poet, pure mathematician, or another might give local habitation and a name within that mind. Their very airy-nothingness, the fact that their Being consists in mere capability of getting thought, not in anybody’s actually thinking them, saves their Reality. The second Universe is that of the Brute Actuality of things and facts. I am confident that their Being consists in reactions against Brute forces, notwithstanding objections redoubtable until they are closely and fairly examined. The third Universe comprises everything whose being consists in active power to establish connections between different objects, especially between objects in different Universes. Such is everything which is essentially a Sign – not the mere body of the Sign, which is not essentially such, but, so to speak, the Sign’s Soul, which has its Being in its

power of serving as intermediary between its Object and a Mind. Such, too, is a living consciousness, and such the life, the power of growth, of a plant. Such is a living constitution – a daily newspaper, a great fortune, a social ‘movement.’” (Peirce, CP, 6. 455).

The dynamic interaction between these three categories makes up the triadic sign, where the representamen is Firstness, the object is Secondness and the interpretant is Thirdness and together they produce meaning in all the living sign-producing beings. In humans, a grammatically ordered generative system of signs obtains a special status as the type of modeling system we call “natural language.” But how do we get from the phaneroscopic or phenomenological or radical constructivist observing process to an intersubjective system of signs producing the very meaning about our reality, which we discuss here in ontological and epistemological terms?

### Spencer-Brown

Giving up the Platonic idea that there is a transcendental structure that gives logical and geometrical form to all phenomenological and/or constructivist observations has the consequence that nothing exists without it being part of an observation process. Thus, no observers, no world! Therefore there can be no reality outside observing. Thus the idea of an “observation-independent reality” is abandoned even more radically than in Kant’s concept of “a thing in itself.” In all versions of constructivism, such as von Glasersfeld’s radical constructivism and the constructivist approaches of von Foerster and Maturana, there are only “observer-dependent realities” or “multiversa” as Maturana (1988) called them. Is it then us as individual observers that create the world we live in, and do we, as well as different cultures, live in absolutely different worlds? If so, we must somehow be in the same medium of observing mind/spirit in which we create worlds. But we cannot be complete monads since we create societies – unless this theory is completely solipsistic and there is only Leibniz’s way out, hooking them all up to the divine monad, which then coordinates all knowing and acting from the divine principle. This makes it difficult to understand how we, starting from the common individual point in both von Glasersfeld’s,

Maturana's and early Husserl's theory, can manage to co-create anything or know anything about that which is partly independent of ourselves, such as whether the threat of global warming is real.

Von Glasersfeld (2007) claims that radical constructivism and similar paradigms are purely epistemological. This, however, does not seem possible, because radical constructivism has already assumed at least one ontological fact, namely that observation exists and that it is the primary aspect of reality. This also raises the problem of an observer and the ontological status of the observer. At least in the second-order cybernetics of von Foerster, and in Maturana and Varela's autopoiesis theory, the observer appears as an ontological fact (Brier 2007). Therefore it seems legitimate to ask where, when and how this observation takes place. Was/is it outside space and before time? Or rather before anybody made a human definition of time and space so that we emerge as observing beings in what we call time and space – or, with Einstein, “space-time” – as a result of this original choice of making a distinction? That would take philosophy one step further back to the origin of reality than Kant's argument that *space and time* are pure forms of intuition. He wanted to show that we have synthetic *a priori* knowledge of the spatial and temporal forms of outer and inner experience, grounded in our own pure intuitions of space and time. Our conceptions of space and time cannot be derived from experience of objects in themselves. Spatiality and temporality are only forms in which objects appear to us. Experience presupposes the individuation of objects in space and/or time (Guyer 1998).

Radical constructivism urges us to take one step further back to observation as the original act before space and time were constructed. This view seems to assume that the first observation is the original creation. This is, at least, a reasonable interpretation of Spencer-Brown (1969, 1972, 1974).

“[A] universe comes into being when a space is severed or taken apart. The skin of a living organism cuts off an outside from an inside. So does the circumference of a circle in a plane. By tracing the way we represent such a severance, we can begin to reconstruct, with an accuracy and coverage that appear almost uncanny, the basic forms

underlying linguistic, mathematical, physical, and biological science, and can begin to see how the familiar laws of our own experience follow inexorably from the original act of severance. The act is itself already remembered, even if unconsciously, as our first attempt to distinguish different things in a world where, in the first place, the boundaries can be drawn anywhere we please. At this stage the universe cannot be distinguished from how we act upon it, and the world may seem like shifting sand beneath our feet. ... it becomes evident that the laws relating such forms are the same in any universe. It is this sameness, the idea that we can find a reality which is independent of how the universe actually appears, that lends such fascination to the study of mathematics.” (Spencer-Brown 1969: V)

It is my interpretation that Spencer-Brown thus finds those regularities that Peirce calls “Thirdness” in the emergence and evolution of the process of observing on such a general level that they work as logical and mathematical forms in any universe, just like Peirce's three categories. Thus constructivism does lead to a stable element of Thirdness. Thirdness is the habits of the evolutionary process. Thus it is never absolute and unchangeable but always evolving. But the creation of the habit of mind and nature is the common foundation of cybernetics and semiotics, integrating them into “cybersemiotics,” as will be explained later in the paper.<sup>3</sup>

But it still leaves us wondering how creating the world from making distinctions can work, unless more can be explained about the nature of this process of pure observation. A closer look at Spencer-Brown's text reveals that it is clearly described from a kind of objective idealist world view. This is a rare position in constructivism and his position may in the end have to be called something else. But Spencer-Brown actually worked out such a view in the footnotes in his book *Only Two Can Play This Game*, written under the name of James Keys (1974). Here he addressed the emergence of form at that (mystical unity) state of being aware,

3] So far I have not seen any text from Maturana where he goes this far in metaphysics, as he sees observers as biological autopoietic systems which, as such, have an existence within time and space.

where the observer, the universe, and the distinction between universe and observer emerge from the unity that is often called void, or in Buddhist philosophy – by which Spencer-Brown is inspired – “emptiness.” This philosophy places “emptiness” and “the void” at a central place in Spencer-Brown's metaphysics, as it is in the pure mysticism of Buddhism, for instance presented in the writings of Nargajuna (1995) in his famous verse:

“Whatever is dependently co-arising  
That is explained to be emptiness.  
That, being a dependent designation  
Is itself the middle way.”  
(Garfield 1995: 93)

This verse defining “the middle way” has been the foundation for nearly all major Buddhist schools in East Asia (Garfield 1995). This and Kant's philosophy is important to have in mind when reading the following quotation from Spencer-Brown:

“Space is a construct. In reality there is no space. Time is also a construct. In reality there is no time. In eternity there is space but no time. In the deepest order of eternity there is no space. It is devoid of any quality whatever. This is the reality of which the Buddhas speak. Buddhists call it Nirvana. Its order of being is zero. Its mode is completeness.” (Spencer-Brown 1974: 127 note 1)

The observer, thus, arises from his or her own ways and means of describing, which is to say, by distinguishing him- or herself. George Berkeley (1703–1753) took the observer dependency of things seriously and referred to God as the original observer. Thus the reason that my house still exists in spite of my being somewhere else is that God observes the world. God is the original observer who creates the world inside his own self-observation. We are all part of God's observation process or, rather, the fundamental observation process is what we call God, which can be said to be a circle whose centre is everywhere, whose circumference is nowhere. This pure observational view also points to Buddhist philosophy, which seem to be influential to the framework Spencer-Brown uses. This is an influence he shares with Peirce. Peirce wrote in this rather long passage:

“If we are to proceed in a logical and scientific manner, we must, in order to account for the whole universe, suppose an initial condition in which the whole universe was non-existent, and therefore a state of absolute nothing...”

“We start, then, with nothing, pure zero. But this is not the nothing of negation. For not means other than, and other is merely a synonym of the ordinal numeral second. As such it implies a first; while the present pure zero is prior to every first. The nothing of negation is the nothing of death, which comes second to, or after, everything. But this pure zero is the nothing of not having been born. There is no individual thing, no compulsion, outward nor inward, no law. It is the germinal nothing, in which the whole universe is involved or foreshadowed. As such, it is absolutely undefined and unlimited possibility – boundless possibility. There is no compulsion and no law. It is boundless freedom...”

“Now the question arises, what necessarily resulted from that state of things? But the only sane answer is that where freedom was boundless nothing in particular necessarily resulted...”

“I say that nothing necessarily resulted from the Nothing of boundless freedom. That is, nothing according to deductive logic. But such is not the logic of freedom or possibility. The logic of freedom, or potentiality, is that it shall annul itself. For if it does not annul itself, it remains a completely idle and do-nothing potentiality; and a completely idle potentiality is annulled by its complete idleness.” (Peirce CP 6.215–219)

The concepts of nothingness and emptiness are central to Peirce’s as well as Spencer-Brown’s evolutionary theory of how form or the basic categories come into existence in *Laws of Form* (1969). In another rather long but very central passage, Peirce argues how qualities arise from emptiness.

“Every attempt to understand anything – every research – supposes, or at least hopes, that the very objects of study themselves are subject to a logic more or less identical with that which we employ.

“... Looking upon the course of logic as a whole we see that it proceeds from the question to the answer – from the vague to the definite. And so likewise all the evolution we know of proceeds from the vague to the definite. The indeterminate future becomes the irrevocable past ... the undifferentiated differentiates itself. The homogeneous puts on heterogeneity ... as a rule the continuum

has been derived from a more general continuum, a continuum of higher generality. ...

“If this be correct, we cannot suppose the process of derivation, a process which extends from before time and from before logic, ... began elsewhere than in the utter vagueness of completely undetermined and dimensionless potentiality.

“The evolutionary process is, therefore, not a mere evolution of the existing universe, but rather a process by which the very Platonic forms themselves have become or are becoming developed ...

“The evolution of forms begins or, at any rate, has for an early stage of it, a vague potentiality; ... that ... is followed by a continuum of forms having a multitude of dimensions too great for the individual dimensions to be distinct. It must be by a contraction of the vagueness of that potentiality of everything in general, but of nothing in particular, that the world of forms comes about...”

“The sense-quality is a feeling.... Imagine a magenta color. Now imagine that all the rest of your consciousness – memory, thought, everything except this feeling of magenta – is utterly wiped out, and with that is erased all possibility of comparing the magenta with anything else or of estimating it as more or less bright. That is what you must think the pure sense-quality to be. Such a definite potentiality can emerge from the indefinite potentiality only by its own vital Firstness and spontaneity.... It is a First.” (Peirce CP 6.189–198)

In this way, Peirce arrives from emptiness in an evolutionary thinking to the first basic qualities of experience and thereby his first and most basic category, Firstness, which later leads to Secondness and Thirdness. As such, they were alternatives to Kant’s categories or, rather, a new and deeper development of categorical thinking, which deals with the problem that all thinking and sensing processes needs categories to interpret and understand what is sensed and how to combine signs. To discover these basic ideas of quality was also the intention of Husserl in the first stage of his phenomenological philosophy. He was accused of Platonism, because he did not have Peirce’s evolutionary thinking, where the ideas – which Plato saw the necessity for any kind of rational thought – as qualities of experience (qualia) emerge from vague beginnings. This pure constructivism starting in an emptiness that is a wholeness, and thinking in evolutionary terms is from where Peirce develops his virtual logic or the processes that leads

to that logic, which Plato and Aristotle saw as foundational to the structure of the world and the rationality of human thinking: Logos. The Greek idea of “logos” has led to the prevalent ontological idea of “natural kinds” in the world. It is these natural kinds that it is the purpose of natural science to discover and classify. The other aspect of the logos is the classical logic discovered by the ancient Greek philosophers and viewed as the core of rationality – not only human, but all rationality. The core of that rationality is the divine Logos in Greek thinking; but in modern technological development, in the age of the computer, this vision has led to the development of Artificial Intelligence and the idea – to some, a deep belief – that a machine could become more rational than humans, somehow expected to develop – what you could almost call – divine rationality.

In my view, it is this whole idea of a static law-ruled universe and a static logically-based rationality that most forms of constructivism want to challenge. But the radical forms ignore intersubjectivity as real. Social constructivism builds on intersubjectivity and therefore culture and language as the constructors, but even they also tend to forget to integrate and reflect natural evolution as a constructor. This is probably because the evolution of the world from the view point of the sciences is looked at as something material and mechanical. But this is clearly not a sufficient basis for understanding the emergence of life and consciousness (see Brier 2008a for further argumentation). So what are the choices then, if one does not want to be caught in solipsistic sensualism? Well, as we have mentioned, Husserl moved towards an intersubjective foundation of his phenomenology but never got round to including evolution. Georg Wilhelm Friedrich Hegel is famous for his evolutionary objective idealism combined with Enlightenment rationality thinking, which encompassed both the evolution of nature and culture as aspects of the development of the Spirit. He was – like Kant – also an inspiration for Peirce. Although Hegel’s philosophy is also referred to as phenomenology, he did not manage to include the state of emptiness and the development of qualia as Peirce did. Peirce described the *prime difference* between his objective logic and that of Hegel as follows:



“[Hegel] says, if there is any sense in philosophy at all, the whole universe and every feature of it, however minute, is rational, and was constrained to be as it is by the logic of events, so that there is no principle of action in the universe but reason. But I reply, this line of thought, though it begins rightly, is not exact. A logical slip is committed; and the conclusion reached is manifestly at variance with observation. It is true that the whole universe and every feature of it must be regarded as rational, that is as brought about by the logic of events. But it does not follow that it is constrained to be as it is by the logic of events; for the logic of evolution and of life need not be supposed to be of that wooden kind<sup>4</sup> that absolutely constrains a given conclusion. The logic may be that of the inductive<sup>5</sup> or hypothetical inference<sup>6</sup>.” (Peirce CP 6. 218)

Thus, with Hegel, Peirce shares objective idealism, evolutionary thinking, and the phenomenological approach. However, he adds his three categories and the metaphysics of emptiness that we find not only in Buddhism but also in the Vedic thinking of Shankara's *Advaita Vedanta* (Isayeva 1993) and Christian mysticism (John of the Cross 2003). Peirce saw Buddhism and Christianity melting together with a transcendental religious view of empathy and love as the foundation of reality; hence his idea of Firstness as pure feeling and an emptiness behind it. Peirce's Firstness is the starting point of every sign, and continues to lie at the core of the ensuing processes of Secondness and Thirdness. The emphasis on feeling and

4 | Peirce is thinking of classical logic and its deductive schemes.

5 | Peirce is here thinking of the use of inductive thinking in empirical science. Induction has no logical power, but combined with deduction it leads to the hypothetical deductive method, which leads to the fallibilistic view of scientific knowledge that Peirce developed as a foundation of his pragmatic thinking, and which was much later developed by Karl Popper.

6 | Here Peirce thinks of his own addition to scientific thinking, namely abductive thinking. This is the first – often vague – stage of having a good idea or hypothesis, a may-be or “would-be,” as Peirce calls it. This hypothesis is neither arrived at by purely deductive or purely inductive logical thinking nor by a rule-driven combination of both.

emotion as central to all “rational” thought is one of Peirce's outstanding contributions to understanding the processes of mind. Such a way of thinking is close to the mystical thinking we find in many cultures and many historical periods inside and outside religions, and is sometimes referred to as “the perennial philosophy.”

## The perennial philosophy

The term *philosophia perennis* was first used by Agostino Steuco in the 16th century in his book entitled *De perenni philosophia libri X* from 1540 (Augustinus Steuchius Eugubinus 1972). Here he wrote that God is “intelligens intellectum et intellectionem [understanding, understood, and still understanding]”; i.e., God is both act, object, and process in the moment of observation. In this book, scholastic philosophy is seen as the Christian pinnacle of wisdom to which, in one way or another, all other philosophical currents point. The idea was later taken up by mathematician and philosopher Gottfried Leibniz, who used it to designate the common eternal philosophy that underlies all religions, in particular the mystical streams within them. In modern times the idea has been popularized by Aldous Huxley (1945). According to him, the perennial philosophy is:

“...the metaphysic that recognizes a divine Reality substantial to the world of things and lives and minds; the psychology that finds in the soul something similar to, or even identical with, divine Reality; the ethic that places man's final end in the knowledge of the immanent and transcendent Ground of all being; the thing is immemorial and universal. Rudiments of the perennial philosophy may be found among the traditional lore of primitive peoples in every region of the world, and in its fully developed forms it has a place in every one of the higher religions.” (1945: vii)

Thus, perennial philosophy is opposed to skepticism, to historicism and other relativisms, to all intellectual sectarianism and to all forms of what Berkeley (1994) appropriately called “minute philosophizing,” or the limiting of aim and method to the analysis of a plurality of small, empirically graspable and unrelated problems.

The importance of perennial philosophy for mystics and religion can be seen in the phrase “Thou Art That,” taken from the Sanskrit of the ancient Upanishads. Here is another central passage from the Upanishads:

“Brahman is sat-chit-ananda.  
It is sat, eternal and unchanging.  
It is chit, pure consciousness, the Self.  
And it is also ananda, bliss.  
Bliss is the nature of Brahman,  
and the experience of Brahman is blissful.  
The expansion of bliss is the purpose of creation.  
In the beginning the world was not.  
From non-existence came Existence.  
From itself Existence created the Self.  
Thus it is called Self-Made.  
Truly, what that Self-Made is,  
is the essence of existence.”  
(Taittiriya Upanishad II.7 – III.6)

The phrase teaches that the immanent eternal self is realized to be one with the absolute principle of all existence, and that the true destiny of human beings is to discover this fact for themselves, to find out who and what they really are. It is believed to be the timeless truth underlying the diverse religions.

The transcendental reality, which is also the divine immanence, is seen as the foundation of our being. As a unity, it is the transcendental-immanence; the one unchanging spiritual ground of all created things. It is the source of all being, all life and all intelligence. From it all beings come forth and all order and intellectual ideas proceed.<sup>7</sup> The perennial philosophy is a view of creation as a world of divine signs. It sees the created world as a system of divine signs. It is a view that sees the world as divided into two aspects: the invisible, unified, unmanifest, implicit, mystical level of reality and the visible, manifold, manifest, explicit, material level of reality; one timeless level and the other temporal. The crucial point of our further discussion, then, is that the latter is understood as derived from and secondary to the former.

7 | There are some subtle differences between the Vedic and the Buddhist versions of mysticism that have been discussed since Shankara's time (Sharma 2009). But these differences are too small to be discussed here.

## The ontology of radical constructivism

Interestingly it seems that most constructivists in second-order cybernetics and autopoiesis consider the perennial philosophical views as either too ontologically binding or too conservative and dominating, although in other situations many of them declare mystical, spiritual or esthetical views. Apart from Spencer-Brown's clearly worked out mystical philosophy, I would count both Louis H. Kauffman and Ranulph Glanville as having such views, seen more indirectly from their writing, especially in some of the columns in *Cybernetics & Human Knowing*. But both avoid saying too much about ontology. It is a form of negative ontology, which can also be found in radical constructivism. I think saying too little of the world is unnecessarily negative.

As argued above, much of second-order cybernetic-constructivism seems to be phenomenological, although the vices and virtues of the paradigm are seldom discussed explicitly. The virtues of a phenomenological paradigm are, in my view, that it says much about us as subjective observers, about subjectivity, observing, and intentionality, and that it presupposes a deep connection between us as observers and the environment before we distinguish between subject and object. But its vices are that a phenomenological viewpoint that is not only seen as a method for describing experience but also as an actual philosophy of knowing has a problem with moving on to a full world view. Maurice Merleau-Ponty, in his foreword to *Phenomenology of Perception* (2005), actually admits that phenomenology is not a fully-fledged philosophy. There is a deep problem of the nature and role of consciousness for observing. Von Glasersfeld sees that clearly in his analysis of Maturana's development of the autopoietic view.

“Humberto Maturana is one of the few authors that nowadays engage the construction of a wide, complete, explicatory system comparable to those of Plato or Leibniz. His ‘autopoietic’ approach includes also the origin of the observer, meant as a methodological *prius* who provides itself a view of the world. Here I try to follow the way Maturana sees the birth of *res cognitians* (entity which gains awareness of what it's doing). I try to demonstrate

that the basic activity of distinguishing can certainly lead to the distinction with which the observer is separated from anything observed. But I conclude that – at least for this interpreter – the origin of active consciousness remains obscure, that is, what works as the agent of distinguishing.” (Glaserfeld 1991: 68)

Husserl expert Zahavi (2002) makes preliminary attempts to overcome the problem of establishing the other (as independent observer and communicator) and consequently intersubjectivity in Husserl's phenomenology. Peirce is, in my opinion, the only phenomenologist who moves further through his definition of the three categories and connects them intrinsically to the foundation of the process of semiosis. Peirce worked independently of the European phenomenological tradition as he – contrary to Husserl's own view – saw Husserl's work as psychological. Not that Peirce despised psychological reasoning. Peirce himself could be considered as America's first experimental psychologist thanks to his work with James Jastrow in the early 1880s and, despite his later emphasis on his logic, could be seen as having made a central and enduring contribution to advanced forms of cognitive psychology.

With Peirce, I share the view that we cannot make progress without, by abductive reasoning, suggesting ontologies through semiosis.<sup>8</sup> This includes the nature of our body, how the other is established, and the question of intersubjectivity. They are parts of the process of making sense. They should therefore not be kept silent and implicit, but we ought rather to state them out in the open, try to test them, and keep improving them, while, of course, being aware that we will probably never get it all “right.” This is in

8 | Peirce saw that there were two distinct classes of probable inferences. He thus chose to separate inductive inferences from what he called “abductive inferences” sometimes also “hypotheses” and “retroductive inferences” (Hintikka 1998). Abduction is fallible qualified guessing. It is a method of logical thought that comes prior to induction and deduction when an inquirer considers if a set of seemingly unrelated facts are somehow connected. Abduction is actually the process of inference that produces a hypothesis as its end result.

accordance with the very point of von Glasersfeld: We are constantly creating reality. In fact in our daily lives we cannot refrain from doing so. However, we can never know with absolute certainty whether the hypothesized ontology is “true,” in either a logical or an empirical sense, because these frameworks are the basis from which we coin our truth criteria. Hence the inescapable metaphysical philosophizing that Peirce realized you could not get around but had to integrate with your science, which was what he did in his last development of pragmatism. There are probably things that we cannot know in a scientific way, such as our inner “life-worlds” or first person consciousness and its emotional and existential structures of meaning processes. Still, we point the way to these phenomena, as is done in the descriptions of the mystical experience of “oneness” or of “emptiness.”

One way of looking at it is to say that we are discussing what the Vedic philosophy calls “Maya,” or the – perceptual and desire-driven – veils that covers the truth. Newly-enlightened persons may think they realize that the materiality of the elephant running towards them does not represent the ultimate reality, only a secondary manifestation in time and space, and they often make the mistake of ignoring it. To their surprise they get seriously hurt. In my opinion, this is also what happens to radical constructivists who would deny the reality of the threat of global warming, for instance.

Maya is only less real compared to the hyper-reality of “emptiness” or “the densely packed region,” as Spencer-Brown (1974) refers to it (See discussion in Sharma 2009, Nargajuna 1995, and Isayeva 1993). As in the movie, “The Matrix,” where people live in a computer-generated “reality,” it is not the ultimate real reality. Still, it is so very real for those who live in the matrix, but cannot yet “read the matrix” and manipulate it, and therefore die in it as the result of actions in this unreal world. Actually, the matrix is their only reality. They live and die there. The matrix cannot be ignored, not even by the enlightened ones. In a similar way von Foerster argues:

“I have the theory of observing, I am myself an observer, so I am doing the observing ... I am including myself into the loop of argumentation. And in which way can I handle that?”

“So, my proposition here is now that in the second phase of cybernetic evolution a serious attempt was made to cope with the epistemological and the methodological *Grundlagen* propositions that appear if you begin seriously to include the observer in the descriptions of his observations.

“With the first appearance of Maturana’s autopoietic system for all of us who were working in this field the suggestion was immediately made that for the first time we can start here with a biological theory of autonomy, because if we do not stipulate autonomy, observation is not an act of interaction or something like that, observation would just be a transducer...” (Foerster 1981: 104)

Thus biological autonomy, and consequently agency or subjectivity, is a prerequisite for observation for von Foerster and Maturana whence the world is brought forth as a stabilized structural coupling called “eigenforms” in von Foerster’s philosophy. Although our world takes on the aspect of an eigenform, I wonder which ontological presumptions are necessary for this philosophy of the biological autonomy of perception and reality as eigenform, if not the perennial philosophy? Already, using biological autonomy as a point of departure is to acknowledge that we can only bring forth worlds that are compatible with our survival as living autopoietic beings. There is a lot of implicit and tacit knowledge of reality in that acknowledgment, and this knowledge is the basis from which we perceive and think and make those basic distinctions of observing the very nature that we now have to discuss.

## Three questions for constructivism

### What is the nature of a distinction?

This is pretty much the question that Husserl’s and Merleau-Ponty’s phenomenology attempts to answer. They agree with Spencer-Brown, second-order cybernetics and Luhmann that distinctions are conditions of an observer. Furthermore, distinctions are conditions of experience or imagination, where something is seen to be different from something else. This is what Bateson (1973) calls a difference that makes a difference. But he forgets theoretically and philosophically to make explicit that distinc-

tions are inextricably linked with the awareness of the observer. Bateson instead defines his *Plethora* and *Creatura* and cybernetic mind. Bateson builds his bridge to his understanding of mind and the sacred on these two categories. They were originally established by Carl Jung (1962): thus *Plethora* is the physical domain governed by forces – the movements of stones, for example – and *Creatura* is the domain governed by distinctions and differences, e.g. life. According to Bateson, making a difference is crucial to the cybernetic mind. Every living system can be called “mental” that has the following mind-like characteristics:

“1. The system shall operate with and upon differences.

“2. The system shall consist of closed loops or networks of pathways along which differences and transforms of differences shall be transmitted. (What is transmitted on a neuron is not an impulse, it is news of a difference).

“3. Many events within the system shall be energized by the respondent part rather than by impact from the triggering part.

“4. The system shall show self-correctiveness in the direction of homeostasis and/or in the direction of runaway. Self-correctiveness implies trial and error.” (Bateson 1973: 458)

Mind is synonymous with the cybernetic system composed of a total, self-correcting unit that prepares information. Mind is immanent in this wholeness. When Bateson says that mind is immanent, he means that the mental is immanent in the entire system, in the complete message circuit. One can therefore say that mind is immanent in the circuits that are complete inside the brain. But mind is also immanent in the greater circuits that are complete inside the system “brain + body.” Finally, mind is immanent in the even greater system “organism + environment,” which is identical to the elementary unit of evolution, i.e. the thinking, acting and deciding agent. Bateson wrote:

“The individual mind is immanent, but not only in the body. It is immanent also in pathways and messages outside the body; and there is a larger Mind, of which the individual is only a subsystem. This larger Mind is comparable to God and is perhaps what some people mean by ‘God,’ but it is still immanent in the total inter-connected so-

cial system and planetary ecology. Freudian psychology expanded the concept of mind inward to include the whole communication system within the body – the autonomic, the habitual and the vast range of unconscious processes. What I am saying expands mind outward. And both of these changes reduce the scope of the conscious self. A certain humility becomes appropriate, tempered by the dignity or joy of being part of something bigger. A part – if you will – of God.” (Bateson 1973: 436–437).

This raises the second fundamental question:

### What is the minimum ontology necessary to accept observing?

At the most basic level one might focus on the process and say that an observer arises in the condition of the process of making a distinction where something is seen and someone sees. This is the process of knowing. As both Spencer-Brown and Peirce point out, it is a triadic process. Spencer-Brown wrote:

“The explanation of the Trinity in fact turns out to be quite simple enough. When you make a distinction of any kind whatsoever, the easiest way to represent its essential properties mathematically is by some sort of closed curve like a circle. Here the circumference distinguishes two sides, an inside and an outside. The two sides, plus the circumference itself, which is neither the inside nor the outside, together make up three aspects of one distinction. Thus every distinction is a trinity. Hence the First Distinction is the First Trinity.” (Spencer-Brown 1974: 128–129)

As Spencer-Brown explains, in the process of observing, this unity of Firstness of the One is cut in two – or divided – in the process of the first distinction into an observing system that now goes from transcendent Oneness to a manifest form, and therefore has to become autopoietic, as Maturana and von Foerster point out, because it now has to exist in an environment that is the unmarked site of the distinction. Thus from the original view, they are One or Oneness only, but a new level of reality has now formed (the world) through the first distinction, and on that level they are different. It is like islands that seem to be separated at sea level, but are connected in a continuum at the sea bottom.

The system of distinction-making as a whole – the Form in Spencer-Brown’s philosophy – is form- or sign-producing and has now produced the inherent agency that was not accounted for in Luhmann’s system theory. To Peirce, cognition is sign producing (signification) and therefore the production of signification and meaning. Viewed as such, Spencer-Brown’s theory is also a triadic semiotics. In his phaneroscopic analysis, Peirce arrived – as mentioned above – at the three cenoscopic categories – Firstness, Secondness and Thirdness – that are so crucial in the metaphysics he built:

“It seems, then, that the true categories of consciousness are: first, feeling, the consciousness which can be included with an instant of time, passive consciousness of quality, without recognition or analysis; second, consciousness of an interruption into the field of consciousness, sense of resistance, of an external fact, of another something; third, synthetic consciousness, binding time together, sense of learning, thought.” (Peirce CP 1.377, c. 1885)

These are just some of the necessary reflections on the prerequisites for making a distinction and producing a meaningful sign to make the difference make a difference to oneself, but also to sign producers and users, which again with it carries an ontology, be it mythical, religious, metaphysical or just philosophical. Common sense beliefs cannot be used as part of theory construction, though many theorists seem to lapse into common sense as a grounding for when flaws turn up in their theory. At the same time, one’s theory has to explain the common sense world appearance in a better way than common sense does, as well as the theories building on it. Thus, like the quantum theory and the relativity theory, it has to explain more and deeper, but still achieve results compatible with Newtonian physics in our common sense world’s “normal range,” especially if the researcher is of the conviction that they represent radically different world views.

I am not attempting to construct a “theory of the world” in an ideoscopic way. Though I do not – on the other hand – deny the value of science and the obligation to use its knowledge. But what we do here is philosophy and metaphysics of the

prerequisites of the production and value of scientific knowledge and knowledge in general. The aim is to create generalized ways of speaking about knowledge and knowing and how we, based on the reflection on past knowledge and the reflection on the present knowledge as well as on the basic conditions of knowing, make the leap into the future that we call knowing. The hope is that it can connect cultures through all times and lead forward in order to avoid needless suffering.

Inspired by the philosopher Novalis, Martin Heidegger (1995) calls philosophizing an attempt to answer the little “homesick” voice in our heads that wants to know “what it is all about,” that insists on asking how it all started, what “it” is, and who we really are. Like Heidegger, I refuse to call these “pseudo-questions.” From Peirce’s perspective, even the concept of observation and the observer is epistemological as well as ontological. The process of observation demands something or some system or structure or regular process that makes the process of observing manifest itself in this world. This manifestation is the triadic element of semiosis that makes the emergence of a possible interpretant. Thus, from the Peircean perspective, the question becomes: What does it take to make an interpretant? or: How does the observer emerge?

### What can be said about how the observer arises in observation?

The universe model manifest from the work of science appears to be “fine-tuned” to allow the existence of life as we know it. See, for instance, Hawking (1989), who here asks, “What is it that breathes fire into the equations and makes a universe for them to describe? ... Why does the universe go to all the bother of existing?” Hawking does not see beyond his equations to the deep problem of how life, consciousness, qualia, free will, and meaning arose in a “physical universe” to allow conscious observing based on qualia, which is the ability to experience the qualities of colors or different kinds of tastes for example.

As any kind of constructivism has its prerequisite, we must conclude from our investigations so far that at least the observer, the body, consciousness and rationality exist as fairly stable structures and processes, but

probably in a way that is not scientifically explicable in its totality. As science clearly has observation and observer as well as mind, consciousness, signification and rationality as prerequisites, it is hardly likely that we can get a full and true scientific explanation of these matters, as the father of modern philosophical hermeneutics, Hans-Georg Gadamer (1975), also points to in his analysis of hermeneutics as the philosophy of science basis for the humanities. He did not argue against science and its methods, but he rejected the naïve idea that rigorous quantitative methods can work without qualitative distinctions as their prerequisites. The observer’s mind also needs the ability to order or classify his observations in order to make signs of something. This is the process that Peirce calls abduction. Thus sense perception can be abductive in its first instances as well as the ordering of signs in the mind into a meaningful whole. The world as such is not hidden. Why assume a “thing in itself” that is hidden from us? A superfluous concept, if we have no means of getting to know it at all, as radical constructivism points out.

Very much in line with Spencer-Brown, Peirce explains in his philosophy why distinctions, and thereby observers and semiosis, arise in this world. He most interestingly points out that God – as a pure transcendental being – cannot be said to be conscious and therefore make conscious distinction, since consciousness as we know it demands a body in order to function and make observation possible. Peirce wrote:

“Since God, in His essential character of *Ens necessarium*, is a disembodied spirit, and since there is strong reason to hold that what we call consciousness is either merely the general sensation of the brain or some part of it, or at all events some visceral or bodily sensation, God probably has no consciousness.” (Peirce CP 6.489)

Embodiment was thus essential to Peirce for the emergence of consciousness. Thus, the divine is rather a huge unconsciousness that needs to develop its negation in the form of cognitive embodied autopoietic living systems in order to observe itself, as Spencer-Brown points out. Spencer-Brown explains the origin of observing very clearly along these lines:



“Let us then consider, for a moment, the world as described by the physicist. It consists of a number of particles which, if shot through their own space, appear as waves... All these appear bound by certain natural laws which indicate the form of their relationship.

“Now the physicist himself, who describes all this, is, in his own account, himself constructed of it... Thus we cannot escape the fact that the world we know is constructed in order ... to see itself...

“Not so much in view of what it sees, although this may appear fantastic enough, but in respect of the fact that it can see at all.

“But in order to do so, evidently it must first cut itself up into at least one state, which sees, and at least one state, which is seen. In this severed and mutilated condition, whatever it sees is only partially itself. We may take it that the world undoubtedly is itself ... but, in any attempt to see itself as an object, it must...act so as to make itself distinct from, and therefore false to, itself. In this condition it always partially eludes itself.

“It seems hard to find an acceptable answer to the question of how or why the world conceives a desire, and discovers an ability, to see itself, and appears to suffer the process. That it does so is sometimes called the original mystery.” (Spencer-Brown 1972: 104–105)

It is conceivable to think that Peirce gave an answer to Spencer-Brown's question, i.e., why does the divine fold back on itself in pain, which is: to produce embodied consciousness in order to be able to observe and experience (Brier 2008d). We cannot talk about transcendence without immanence. It is only through the cenoscopic reflection that Spencer-Brown arrives at his basic question.

Thus there is a deep connection between an epistemology of observing and an ontology of observing. Any valid theory of the universe must be consistent with our existence as human beings (“put the knower into a known,” etc.), if not permanently then at least at this particular time and place in the universe, even though a radical constructivist may say that the problem with the world is that we forgot how we made it. But our discussion about it is going on in language and other signs. Thus analyzing the prerequisites for the meaningful exchanging of signs in communication and the production of meaning of perception into signs may be one of the ways to find out more synthetically *a priori*.

## Semiotics

A sign process needs a representamen, an object and an interpretant to communicate something about the object to somebody in some aspect. Not all possible representamens are signs. There are, for example, many habits and aspects of nature (potential signs or signs that have not found a human interpretant) that we have not yet interpreted. They have to become integrated in a triadic semiosis (a relation process) in which an interpretant is established. The ability to make interpretants is what the observation process is all about. Instead of Kant's “thing in itself,” Peirce operates with a “dynamical object,” the ideal limit of all the “immediate objects” created through interpretants and interpretants' interpretants worked out through endless time by all scientists, or at least a group of dedicated scientists.

The sign represents the immediate object that contains some aspects of the dynamical object. The immediate object is what the sign “picks up” from the dynamical object and mediates to the interpretant.

The Greeks' idea of rationality came from the divine: the Logos or “nous,” and from here sprang the order of reality in the form of a Cosmos. This is not a scientific explanation, but a way to name something one observes when realizing that an ordering principle is necessary to make sense of observations as well as to introduce order into the observed.

In the mystical view of both Aristotle and Plato, this ordering rationality was the common ground for both the inner and outer world. But they never realized that the “material world,” too, as well as the “forms,” develops over time. In the philosophy of Peirce (1994), this was taken into account, and the connecting rationality was the process of triadic semiotics. Logic is seen as emerging out of semiosis. *Logic as Semiotic: The Theory of Signs*, as one of his papers is called (contained in Peirce 1994).

Peirce based semiotics on the three cenoscopic categories: Firstness, Secondness and Thirdness, which connected the inside and outside aspect of reality or the world. Thus even to Peirce's pragmatic process philosophy, there is a deep connection between the forms of the process of observing (cognition) and the forms underlying the dynamic

structure of the environment of the observer (“the world”).

Thus there are really no private object worlds. This may be what Maturana means when he says that objects arise in language. In his *Philosophical Investigations*, Wittgenstein (2001) conceptualizes it as “language games,” which are games of naming within certain “life forms.” As Wittgenstein had a profound influence on von Foerster this could have been in the back of his mind when von Foerster formulated his “Corollary Number One” based on Maturana's “theorem,” “Anything said is said by an observer”:

“I would like to add to Maturana's Theorem a corollary, which, in all modesty, I shall call ‘Heinz von Foerster's Corollary Number One:’ ‘Anything said is said to an observer.’ “With these two propositions a nontrivial connection between three concepts has been established. First, that of an observer who is characterized by being able to make descriptions. This is because of Theorem 1. Of course, what an observer says is a description. The second concept is that of language. Theorem 1 and Corollary 1 connect two observers through language. But, in turn, by this connection we have established the third concept I wish to consider..., namely that of society: the two observers constitute the elementary nucleus for a society.” (Foerster 1979: 5–6)

Since anything said is said to another observer, we need to make the choice to accept other observers as real prerequisites for the semiosis of observing, and partly independent of us in the immanent reality of time and space. Now language plus linguistic activity is not “linguaging,” which Maturana defines as the coordination of coordinations of behavior. If you think so, you have a completely behaviorist view of language, like Skinner's, unless you consider the coordination as having its own realm of existence in intersubjective consciousness and you thereby accept basic consciousness as a prerequisite for observation and communication. Confronted with this criticism, many years ago at the London School of Economics conference on the relevance of Maturana's autopoietic theory for the social sciences, Maturana accepted that what he is talking about is not language *per se*, but the biological coordinations of behavior, which are a prerequisite for language.

Therefore, in my interpretation, Maturana does not offer a philosophy of language *per se*. That would require a semiotics, as was originally discovered by Saussure and Peirce (Brier 2008b).

## Niklas Luhmann

Niklas Luhmann is the systems scientist and cybernetician who has most clearly taken into account the consequence of language being partly independent of the individual subjective consciousness. He viewed language – or rather total social communication – as a system to which embodied conscious subjects “hook up” through structural couplings with his theory of human beings as a combination of three autopoietic systems. For the problem of intersubjectivity as a true relation – which comes to us through our embodied language – to other embodied consciousnesses, Luhmann developed a new solution. He crafted a generalized version of the concept of autopoiesis:

“If we abstract from life and define autopoiesis as a general form of system building using self-referential closure, we would have to admit that there are non-living autopoietic systems, different modes of autopoietic reproduction, and that there are general principles of autopoietic organization that materialize as life, but also in other modes of circularity and self-reproduction. In other words, if we find non-living autopoietic systems in our world, then and only then will we need a truly general theory of autopoiesis that carefully avoids references that hold true only for living systems.” (Luhmann 1990: 2)

Luhmann does not claim that computers are autopoietic, but that systems exist that are not primarily biological but autopoietic, such as psychic and social-communicative systems. But as far as we know, these can only function if based on a biological autopoietic system.

An important aspect of Luhmann’s theory is that he defined the three systems as closed systems that are also closed to each other. Although all three are present and function simultaneously in human beings, there are no direct “inner connections” between them as systems; they communicate only through interpenetration. This is an

elegant cybernetic formulation of the organizational reasons behind the difficulty of integrating self-consciousness, the body-mind, and social communication through language. As Luhmann understood it, human bodies and psyches are the environment of socio-communicative systems. Luhmann further explained the differences between the systems in this way:

“It leads to a sharp distinction between meaning and life as different kinds of autopoietic organization, and meaning-using systems again have to be distinguished according to whether they use consciousness or communication as a mode of meaning-based reproduction. On the one hand, then, a psychological and sociological theory has to be developed that meets these requirements. On the other hand, the concept of autopoiesis has to be abstracted from biological connotations.” (Luhmann 1990: 2)

Luhmann wanted to distinguish, but not explain, these different levels of autopoiesis and to underline that there are psychic as well as social-communicative autopoietic systems that are qualitatively different. He wrote:

“It distinguishes a general theory of self-referential autopoietic systems and a more concrete level at which we may distinguish living systems (cells, brains, organisms, etc.), psychic systems, and social systems (societies, organizations, interactions) as different kinds of autopoietic systems. “This scheme is not to be understood as describing an internal system’s differentiation. It is a scheme not for the operations of systems, but for their observation. It differentiates different types of systems or different modes of realization of autopoiesis.” (Luhmann 1990: 29)

Therefore it is important to understand that communicative systems – most prominently natural language – are autonomous and have their own intrinsic form of closed organization, aspects of which transcend both biological and psychological autopoiesis. For Luhmann (1995), communication is a sequence of selections of information, utterances and meaning. This further leads to Luhmann’s theory of social communication systems as autopoietic systems:

“Social systems use communication as their particular mode of autopoietic reproduction. Their

elements are communications that are recursively produced and reproduced by a network of communications, which cannot exist outside of such a network. Communications are not ‘living’ units, they are not ‘conscious’ units, and they are not ‘actions.’” (Luhmann 1990: 3)

Supplementing von Foerster’s and Bateson’s theories, for Luhmann, communication

“... is not at all ... a process of ‘transferring’ meaning or information... it is a shared actualization of meaning that is able to inform at least one of the participants... The notion of such a ‘transfer’ already runs into trouble by assuming the identity of what is to be transferred and thus that possession is relinquished when this transfer takes place, i.e., by assuming some form of zero sum. What remains identical ... is ... a common underlying meaning structure that allows the reciprocal regulation of surprises. That this meaning foundation is itself historical in nature, i.e., that it arises within the history of experience and communicative processes, is another matter altogether and does not contradict my thesis that communication does not transmit or transfer meaning, but rather requires it as pre-given and as forming a shared background against which informative surprises may be articulated.” (Luhmann 1990: 32)

In this way we eliminate the problems of Husserlian phenomenology and solipsistic constructivism. But Luhmann failed to define a theory of meaning that can integrate with his systems theory, as he did not want to specify an objective idealistic philosophy. Except for claiming that the psychic system deals with thoughts, feelings and experience, he did not provide a theory of what they are, and how they came into the world. He worked on an evolutionary basis and therefore might rest his theory on the idea of emergence. But that is not really spelled out anywhere I have been able to find. He attempts to use Husserl’s phenomenology in his system theory but fails to argue for how two so fundamentally different paradigms can be combined. However, in (Brier 2008a) I have argued that through Luhmann’s foundation in Spencer-Brown, in cybersemiotics his whole theory can be inserted into Peirce’s framework. From Peirce’s semiotics we realize that the inner dialogue all observers have when observing their own and others’

observations, depends on sign systems established with other embodied observers. Peircean biosemiotics (Brier 2008b) shows that this happens in the form of sign games (rather than a grammar-based language) even at cell level, organ level, and whole body level, which is where instinctive signs are exchanged. Through evolution, sign webs organize into languages with productive and indexical grammars and a cultural common significations sphere, and become the worlds in which those who share a common language culture exist.

This signification sphere has to be compatible with embodiment and those unconscious sign systems inherited in the body below the level of language in order to preserve the body. As such, on the basis of structural couplings, signs, words and concepts refer to a common (intersubjective) signification sphere or world in which the body can exist and procreate. Therefore, "signification sphere" is first of all the semiotic interpretation of Jakob von Uexküll's (1982) term "umwelt," referring the parts of the world that a living system can perceive and cognitively analyze and thus generate adequate responses to. From an ethological point of view, this is the part of the world that a living system reacts to by reflexes and instinctive movements: for example, food, prey, predators, obstacles and mating partners. But when language and consciousness is developed, a much more differentiated world emerges for the human organism and its culturally encoded perception.

## Language

Language is not the invention of single individuals. Individuals arise in the social context of language. Reality arises for us as a commonality only within language and socially embodied semiotic practice. Language itself is a dynamic and complex growing dynamical structure as long as there are enough members of the culture to uphold it. Realities produced in this way are always both social and personal, and they all appear to have constraints coming from their structural coupling with the environment, which are open to investigation.

Language expands our semiotic freedom but is limited by the conditions for

keeping our body alive. Terrence Deacon (1997) even suggests that the ability to carry language, and the social coordination advance that gave, was a selective factor on our brains. We become infected with language and go from being animals to humans. We are forced out of an innocent non-reflective state of animal being.

Semiotics, in Peirce's conception, is clearly a relational and evolutionary form of logic. We are the world that has cut itself in two in order to observe itself and gain consciousness. This interaction has some minimal rules, which is what Spencer-Brown tried to describe in *Laws of Form*, and Peirce in the various ways of semiosis or sign types and classes. Thus – by combining the insights of Spencer-Brown and Peirce – we see that *the so-called laws of nature are in fact the "Laws of Form of semiosis."*

I agree with Varela's critique of the lack of a concept and function of time in *Laws of Form*; it is necessary to complete the reflective circle of thinking and, in that movement, self-organize cognition and preserve the psyche, which of course leads in the direction Luhmann developed. On the other hand, as mentioned, as far as I understand Spencer-Brown from *Only Two can Play this Game*, he is thinking at the level of existence where time and probably space has hardly begun. It is a kind of Platonic form of interaction, which is something different from the perceptual essences early Husserl (1997, 1999) was looking for, but maybe closer to what the older Husserl worked on. Now we are finally getting to the level where we can start to speak of science.

## Science

Science tries to build up this world of signification through specific methods in a consistent manner in order that a society and its members may survive, procreate, and enlarge its signification sphere and semiotic freedom in intersubjective agreement and maximum joy and love. But there are many things that scientific quantitative methods cannot be applied to, such as meaning, the quality of experience and meaningful interpretation. This is where the humanities start and even they have prerequisites that can only be analyzed in a cenoscaphic philosophy.

Knowledge is supposed to be not only viable but also to be good, and to benefit human development as a whole, suggesting a direction of development for our (soon global) culture. It may be accurate to say that the theories of the world that science offers us are "fairy tales,"<sup>9</sup> but often they are very useful fairy tales. We know that they often change in the light of new information. Thus a physician is well-embedded in a modern fairy tale of cause, effect and biochemistry. It is very effective in working with some aspects of disease and prevention. But a good medical researcher understands that he is just part of the story of human health and disease, and that the fairy tales of the doctors may change tomorrow in the light of new information. But it is also important to note that this information is guided by the present structure of the fairy tale, as it sets up the terms and framework of the observation in our effort to be consistent in our development of knowledge and practice. But now and then, completely new or previously ignored ways of looking at the world appear, and we struggle to integrate them in a consistent way by enlarging our paradigm. Cybersemiotics is such an attempt.

As we have pointed to several areas where scientific knowledge cannot be established based on quantitative methods, and as we have shown that science has its prerequisites, it does not seem likely that science will tell us the final truth about our world, if we are talking about including existential truth about beauty, goodness and meaning. But still, it has to try to go as far as it can. No matter how deeply we probe, there will probably always be a part of our reference that is unexplained. In order to see and explain anything, "it" must be explained in terms of "something else" – as a difference. It must be a difference that makes a difference. This difference between two things is what Peirce calls Secondness. The explanation is then – in his view – Thirdness mediating between Firstness and Secondness.

The feeling of Firstness prompts the harsh reality of experience in Secondness to yield the law, rule, or generality of Third-

9| The notion of "fairy tales" describes an absorbing cultural narrative that underpins a world view. The phrase also vividly emphasizes that that this view is not a "truth."

ness. Through Secondness, Peirce saw that the individual was to be distinguished from the general.

In Luhmann's view, science is one of several symbolically generalized media. Its medium is truth and its code: true/untrue (or false). Thus science will be in part competition and part interpenetrational game of language and practice with the other symbolically generalized media (Luhmann 1990) such as faith, love, power, money and art, without any superior judge. Modern society has no center and no overarching rationality, according to Luhmann. According to Peirce, there is a semiotic pragmatic rationality. Thus science *per se* is not the problem, but a fundamentally mechanistic science is.

This brings up the problem of the relation between the objective world that science attempts to uncover, and the world of feeling awareness, love and transcendence. We all share the hope of a better world with more enlightened humane states and a life in love and deep knowing. But a central question in every civilization is how to get there. Communism and Nazism were both serious attempts to make philosophical, occult religious and political ideas overrule science for the "common good." Instead, we hope for an open semiotic rationality that includes emotion and feeling and that can guide us towards negotiation and compromise.

To a certain degree, we construct foundations backwards, based on our reflections on how we have obtained the knowing we have obtained so far. In one way, Paul Feyerabend was correct in that "anything goes." But this is true only so far as one recognizes that constraints and demands for consistency exist. They control the possible spectrum of theories on which you can obtain a necessary amount of agreement in order to produce a viably agreed intersubjective amount of knowledge to make a society function, when you combine metaphysics, theories, hypotheses, empirical discoveries and experienced practices.

Within philosophy of science, it is well-known that data always underdetermine theory (Duhem-Quine thesis), and theoretically an almost infinite number of theories can be built on the data we have. Interpretation therefore needs a combination of epistemological, ontological and axiological assumptions over periods to define "normal

science," as Kuhn argues so well. These are eventually partially disproved as universal theories, and new paradigms or research programs' hard cores (as Imre Lakatos called them) are made in order to cope better with the new problems. But mostly this is done in such a way that we can use most of the knowledge we have already gathered in the current frameworks we are developing and which are often competing with other frameworks. However, it is difficult to argue for giving up concepts of truth and reality as regular principles because of the dynamic nature of knowing and observing. It is obvious to most paradigms that there are regularities in the "world" – however we might want to define it – that can be investigated and used for a betterment of life. At the same time it is a very good thing that an ongoing discussion about the nature of humans and knowledge is part of the whole process of knowing.

## The world as second reality

Although the position we have constructed so far allows a new critical and socially reflected understanding of understanding and of the cultural production of knowledge, it accords in neither a one-to-one way with our everyday experience of matter and nature nor with the experiences of the natural scientist about the reality and stability of natural things (what philosophers call "natural kinds"). For example, eigen-functions (as seen by von Foerster) cannot just come randomly out of the blue. There must be some kind of connection to the world, as Peirce already saw in his work with the basic categories, as well as Konrad Lorenz (1982) in his development of evolutionary epistemology to explain Kant's categories by the way of the evolution of cognitive systems (Brier 2008a). Von Foerster realized that accepting the reality of the biological system of an observer leads to further acceptance of the self-organized structure of the surrounding environment. In 1960 he wrote:

"...I propose to continue the use of the term 'self-organizing system,' whilst being aware of the fact that this term becomes meaningless, unless the system is in close contact with an environment, *which possesses available energy and order,*

and with which our system is in a state of perpetual interaction, such that it somehow manages to 'live' on the expenses of this environment." (Foerster 1984: 4)<sup>10</sup>

Both the self-organizing system, and the energy and order of the environment, must be given some objective reality for this viewpoint to function:

"... to show that there is some structure in our environment..., by pointing out that we are obviously not in the dreadful state of Boltzmann's 'Heat Death.' Hence presently still the entropy increases, which means that there must be some order – at least now – otherwise we could not lose it. "Let me briefly summarize the points I have made so far: (1) By a self-organizing system I mean that part of a system that eats energy and order from its environment. (2) There is a reality of the environment in a sense suggested by the acceptance of the principle of relativity. (3) The environment has structure." (Foerster 1984: 8)

This regularity that mediates between Firstness (randomness) and Secondness (force, will and differences) is what Peirce calls Thirdness (regularity, mediation and understanding). These universal categories are also modes of inference from abduction to deduction to induction, where induction "mediates" between abduction and deduction.

Summing up, we can say that as soon as we choose to abandon solipsism or working with a theory of knowing and knowledge with a completely undetermined open ontology, and to acknowledge the reality of human beings, we are led to accept as real also their languaging, cognitive abilities, and necessary biological autopoietic structures. But these systems, as we have defined them, cannot exist in an environment without energy, order, and material structure. We must accept some kind of structure in the processes of the world/reality. How much order, and how much process, is a problem to be investigated by the philosophy of science as well as science itself.

10| Many second-order cyberneticians and radical constructivist disagree with this quote, and point out that it was published very early in his career and that his later views were much more constructivist. However, I think that the rationality of the quote speaks for itself.



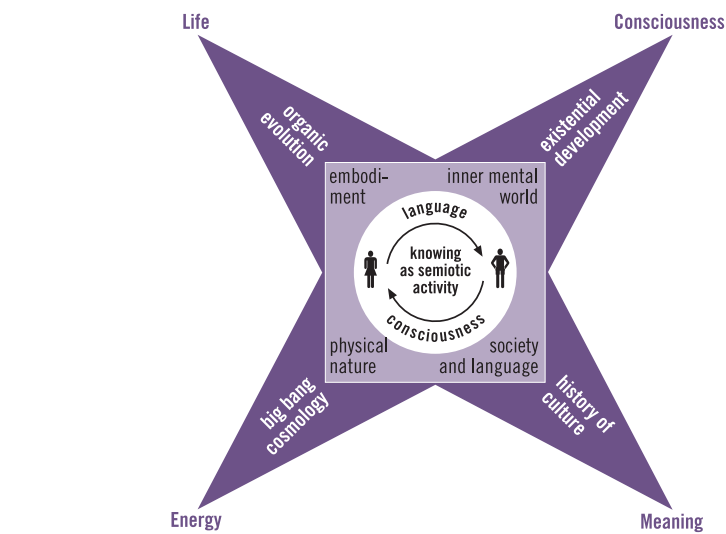
This is what Peirce tries to explain in his cenoscopic semiotic pragmatism, which I think, combined with cybernetics and systems theory as well as information theory to make up cybersemiotics, can place our knowing about knowing on a better, still-dynamic process foundation defining a minimum of three categories. There can be no pure process philosophy. Processes have to take place in some minimal form of regularities or structures to come into manifest existence. Pure randomness and chaos in itself leads to nothing specific, as Peirce wrote above. The importance of our social and embodied practice for the meaning of the signs we exchange is crucial. In order to do anything, one needs a body. Do we create that by observing? Actually one cannot observe anything if one is only transcendental; one needs to have a part of oneself that is immanent in the relative or what we call time and space. The body is a prerequisite for observing. The moment we have observing, we have embodiment.

This is what was sought to be accomplished in cybersemiotics by working out the semiotic star as the result of my cenoscopic semiotic analysis.

## Conclusion: The fourfold semiotics star

As a consequence of the broad agreement that human beings are embodied, feeling, and knowing cultural beings in semiosis and language, one can say that we therefore can be seen as living simultaneously in four different worlds, which are qualitatively different from Popper's (1972) "Three Worlds" and should therefore not be confused with them:

1. Our body-hood as the source of life, which we share with other living species.
2. Our inner world of feeling, will, drives, affections and thoughts, manifested as mind, consciousness and self-consciousness.
3. The physico-chemical-informational aspect of the (non-living) environment of the natural world.
4. The cultural world of language, meaning, symbols, brand, art, power and technology such as the informational machines we call "computers."



**Figure 1:** The semiotic star: A model of how the communicative social system of the embodied mind produces four main areas of knowledge, which can also be analyzed to be prerequisites for interpersonal observation and knowing. Physical nature is usually explained as originating in energy and matter, living systems as emerging from the development of life processes (for instance, the first cell). Social culture is explained as founded on the development of meaning in language and practical habits, and finally our inner mental world is explained as deriving from the development of our individual life world and self-consciousness. All these types of knowledge have their origin in our primary semiotic life world of observing.

As knowledge types, each of the four worlds has historically developed its own type of narrative, especially in its fundamentalist and reductionist versions. Physicists and chemists tend to view the universe as consisting of matter, energy, and meaningless cybernetic information. Mechanical biologists extend this view into their area, but non-mechanical biologists tend to perceive the universe as basically animate or at least view the living systems as the basic organizers of reality. The social and cultural sciences, especially the dialectical and historical materialistic ones, tend to see the world as constructed from social, human, and linguistic interpretations, unless they are dualistic, accepting that nature is as science describes it (Brier 2008c). Thus, energy, life, consciousness and meaning become separated in different domains or worlds. But this is a paradox, since we know from our everyday life world, experienced in linguistic communication, that they are not in any way absolutely separated. Thus the incompatibility of these four dominant views in the Western world's systematic "sci-

entific" knowledge, including the humanities and social sciences, is a deep paradox in the modern world-view's attempt to build a "unified narrative" of the world. Therefore it is broken down into a number of incompatible "small stories" in the so-called post-modern views, some of which are based on various forms of constructivism.

Cybersemiotics, which includes a Peircean semiotics and the cybernetic views of reality, can be seen as a new transdisciplinary philosophical framework that attempts to avoid these inconsistencies. Some of the core aspects of this framework are combined into the model called "the semiotic star" for those who, like me, get a special kind of knowledge by looking at such visual representations. I encourage those to consult Figure 1. Others may be advised to stick with the text.

My suggestion is, in the spirit of phenomenology – or rather Peirce's phaneroscopy – to start in the middle, with our daily lived semiotic and linguistic practice. Like Peirce, I see the semiotic mind at the heart of all four worlds. The basic question in any phenomenologically-based philosophy

of knowledge must be: From what or where comes the ability of the observer to produce knowledge, and to reflect consciously on his knowledge in language and all para-linguistic communication forms?

I have been asked why the figure is static. In a way it is not, as each of its four legs are developing, and the center is therefore a very dynamical semiotic and social exchange, but they are all necessary to make the observations that form the base of our philosophy, science and existential deliberations about what observing and knowing is. Thus the figure has some of the same characteristics as the categories in a processual dynamics of signification: in spite of an ongoing dynamism, certain habits or patterns develop and seem to be inescapable.

How did the first distinction of awareness come about? And how did the world start? What is the connection between these two questions? Were they a one-time occurrence, or are they going on "all the time"? These questions have been separated in the combination of modern science and philosophy that forms our present world view. The first question is answered in cenoscopy and the other one in physics. I hold that our deepest problem in creating a coherent world view is how to integrate those two descriptions. Physics – especially quantum physics – has serious problems, such as how to integrate the observer within the observed. Spencer-Brown wrote about this problem:

“This does not of course mean that the ‘big bang’ theory that cosmologists suggest for the creation of the universe is the true one. The ‘explosion’ into existence does not take place in time, and so from the point of view of time is a continuous operation. Thus the ‘big bang’ theory and the ‘continuous creation’ theory, like all famous ‘rival’ theories in western culture, are both equally true.” (Spencer-Brown 1974: 127)

Again, a view Peirce shares: evolution is creation. But many questions remain unanswered: physically there is the interesting discussion of whether the universe has a time, since in relativity theory, each system within the universe travels with its own time. But the universe is not a system in the usual understanding, as it has no environment. New transdisciplinary ways of framing the questions of existence, truth and meaning have

to be developed. Cybersemiotics contribute to creating such a new view of reality! I am happy to see it used in the work of Esbjorn-Hargens and Zimmerman (2009).

## Acknowledgements

The background for most of the opinions expressed in this paper can be found in my 2008 book, *Cybersemiotics: Why Information Is not Enough*, and the papers published after that, mentioned in the reference list. Still, a lot of the input to this article came, among other places, from a long discussion on the American Society for Cybernetics email list. I have been inspired by arguments here and there from the discussion, but have not used the form of personal quotes as I find that unsuitable for this medium. Thus I hope it will suffice here to thank Burl Gray, Ranulph Glanville, Louis H. Kaufmann and Loet Leydesdorff for their insightful input to discussions, and especially Loet and Louis for many discussions over the years in other forums, and with Louis and Ranulph in the co-construction of their unique columns in *Cybernetics & Human Knowing*. The present version of the manuscript was developed on the initiative of and through lengthy critical interaction with Alexander Riegler, starting at the von Foerster conference in Vienna 2008. Though I know that Alexander does not agree with my argument, I thank him for his efforts to improve its consistency. I am also indebted Bodil Brier for graciously offering to me help to improve the precision of my English language and her great effort in encouraging me time and time again to make myself clearer.

## References

- Atkin A. (2005) C.S. Peirce's pragmatism. *Internet Encyclopedia of Philosophy*. Retrieved from <http://www.iep.utm.edu/peircepr/> on 15 October 2009
- Bateson G. (1973) *Steps to an ecology of mind*. Paladin, New York.
- Bateson G. (1980) *Mind and nature: A necessary unit*. Bantam Books, New York.
- Bateson F. & Bateson M. C. (2005) *Angels fear: Towards an epistemology of the sacred*. Hampton Press, New Jersey. Originally published in 1987.
- Berkeley G. (1751–1752) *The works of George Berkeley, bishop of Cloyne*. Nine volumes. Edited by A. A. Luce & T. E. Jessop. Thomas Nelson and Sons, London.
- Bhaskar R. A. (1975) *A realist theory of science*. Version, London.
- Brier S. (2006) *Informationsvidenskabsteori*. Second edition. Forlaget Samfundslitteratur, Copenhagen.
- Brier S. (2007) Applying Luhmann's system theory as part of a transdisciplinary frame for communication science. *Cybernetics & Human Knowing* 14(2–3): 29–65.
- Brier S. (2008a) *Cybersemiotics: Why information is not enough*. University of Toronto Press, Toronto.
- Brier S. (2008b) The paradigm of Peircean biosemiotics. *Signs* 2: 30–81.
- Brier S. (2008c) Bateson and Peirce on the pattern that connects and the sacred. In: Hoffmeyer J. (ed.) *A legacy for living systems: Gregory Bateson as a precursor for biosemiotic thinking*. Biosemiotics 2. Springer, London: 229–255.
- Brier S. (2008d) A Peircean pantheist scientific mysticism. *International Journal of Transpersonal Studies* 27: 20–45.
- Deacon T. W. (1997) *The symbolic species*. Norton, New York.
- Deely J. (1990) *Basics of semiotics*. First Edition, Indiana University Press, Indiana.
- Esbjorn-Hargens S. & Zimmerman M. (2009) *Integral ecology: Uniting multiple perspectives on the natural world*. Integral Books, Boston MA.
- Foerster H. von (1979) The cybernetics of cybernetics. In: Krippendorff K. (ed.) *Communication and control in society*. Gordon and Breach Science Publishers, New York: 5–8.
- Foerster H. von (1981) On cybernetics of cybernetics of cybernetics and social theory. In: Roth G. & Schwegler H. (eds.) *Self-organizing systems, an interdisciplinary approach*. Campus, Frankfurt: 102–105.
- Foerster H. von (1984) On self-organizing systems and their environment. In: *Observing systems*. Intersystems, Seaside CA: 2–23. Originally published in Yovits M. C. & Cameron S. (eds.) (1960) *Self-Organizing systems*. Pergamon Press, London: 31–50.
- Foerster H. von (2003) Ethics and second-order cybernetics. In: *Understanding understanding*. Springer, New York: 287–304. Originally



## THE AUTHOR

Søren Brier is full professor for Semiotics of Information, Cognitive and Communication Science at Copenhagen Business School. He holds a Masters in biology from the University of Copenhagen and a Ph.D. in philosophy of (information) science. In 2006 he defended a doctor habilitation thesis in philosophy, *Cybersemiotics: Why Information Is Not Enough* at CBS. Brier is the founder and editor-in-chief of *Cybernetics & Human Knowing*, published since 1992, co-founder of "The International Association for Biosemiotic Studies" in 2005, a former trustee for the American Society for Cybernetics, member of the board of the "Sociocybernetics Group" (ISA) and member of the International Institute for Advanced Studies in Systems Research and Cybernetics. He has received its System Research Foundation's Distinguished Service Award and the Systems Research Foundation Award for his great contribution to the advancement of Cybernetics, and The Warren McCulloch Award from the American Society for Cybernetics, of which he is a fellow. Web site: <http://www.brier.dk>.

- published in French in: Ray Y. & Prieur B. (eds.) (1991) *Système, éthique, perspectives en thérapie familiale*. ESF editeur, Paris: 41–55.
- Gadamer H.-G. (1975)** *Truth and method*. Seabury Press, New York.
- Glaserfeld E. von (1991)** Distinguishing the observer: An attempt at interpreting Maturana. Retrieved on 28 April 2009 from <http://www.oikos.org/vonobserv.htm>.
- Glaserfeld E. von (2007)** *Key works in radical constructivism*. Sense Publishers, Rotterdam.
- Guyer P. (1998)**. Kant, Immanuel. In: Craig E. (ed.) *Routledge encyclopedia of philosophy*. Routledge, London. Retrieved on October 14, 2009 from <http://www.rep.routledge.com/article/DB047SECT5>
- Heidegger M. (1995)** The fundamental concepts of metaphysics: World, finitude, solitude. Indiana University Press, Indiana.
- Hintikka J. (1998)** What is abduction? The fundamental problem of contemporary epistemology. *Transaction of the Charles S. Peirce Society* XXXIV (3): 503–534.
- Husserl E. (1931)** *Ideas: A general introduction to pure phenomenology*. Translated by W. R. Boyce Gibson. Humanities Press, New York. Originally published in 1913.
- Husserl E. (1970)** *Logical investigations*. 2 Volumes. Translated by J. N. Findlay. Routledge and Kegan Paul: London. Originally published in 1921.
- Husserl E. (1997)** *Fænomenologiens idé*. Hans Reitzels Forlag, Copenhagen. English translation: (1999) *The idea of phenomenology*. Husserliana: Edmund Husserl Collected Works Volume 8. Translated by L. Hardy. Kluwer, Dordrecht.
- Husserl E. (1999)** *Cartesianske meditationer*, Hans Reitzels forlag, København. Translated from Husserl E. (1977) *Cartesian meditations*. Kluwer Academic Publisher, Dordrecht.
- Huxley A. (1945)** *The perennial philosophy*. Chatto & Windus, London.
- Isayeva N. (1993)** *Shankara and Indian philosophy*. Sri Satguru Publications, Delhi.
- John of the Cross (2003)** *Dark night of the soul*. Dover publications, New York.
- Jung C. G. (1962)** *Seven sermons to the dead*. In: *Memories, dreams, reflections*. Edited by Aniela Jaffe. Translated by Richard & Clara Winston. Vintage Books, New York. Originally published in 1916.
- Krippendorff K. (1991)** *Stepping stones towards a constructivist epistemology for mass-communication*. Unpublished manuscript prepared for presentation to the annual meeting of the Deutsche Gesellschaft für Publizistik und Kommunikationswissenschaft in Bamberg, Germany, 8–10 May 1991, 32 pages.
- Kuhn T. (1970)** *The structure of scientific revolutions*. Second Edition. The University of Chicago Press, Chicago.
- Lorenz K. (1982)** Kant's doctrine of the a priori in the light of contemporary biology. In: Plotkin, H. C. (ed.) *Learning, development and culture*. John Wiley, Chichester: 121–143. Originally published as: Lorenz K. (1941) *Kants Lehre vom Apriorischen im Lichte gegenwärtiger Biologie*. *Blätter für Deutsche Philosophie* 15: 94–125.
- Luhmann N. (1990)** *Essays on self-reference*. Columbia University Press, New York.
- Luhmann N. (1995)** *Social systems*. Stanford University Press, Stanford CA.
- Mach E. (1984)** *The analysis of sensations and the relation of the physical to the psychical*. Translated by C. M. Williams. Open Court, La Salle. Originally published in 1896.
- Maturana H. (1981)** *Autopoiesis*. In: Zeleny M. (ed.) *Autopoiesis: A theory of living organization*. North Holland, New York: 21–30.
- Maturana H. (1983)** What is it to see? *Archivos de biología y medicina experimentales* 16: 255–269.
- Maturana H. (1988)** *Reality: The search for objectivity, or the quest for a compelling argument*. *The Irish Journal of Psychology* 9(1): 25–82.
- Maturana H. (2000)** *The nature of the laws of nature*. Yearbook Edition of Systems Research and Behavioral Science, Systems Research 17(5): 459–468.
- Maturana H. & Varela F. (1980)** *Autopoiesis and cognition: The Realization of the Living*. Reidel, Dordrecht.
- Maturana H. & Varela F. (1986)** *Tree of knowledge: Biological roots of human understanding*. Shambhala Publishers, London.
- Merleau-Ponty M. (2005)** *Phenomenology of perception*. Routledge, London. Originally published in French as: Merleau-Ponty M. (1945) *Phenomenologie de la perception*. Callimard, Paris.
- Nargajuna (1995)** *The fundamental wisdom of the middle way*. Translated and commented by Jay L. Garfield. Oxford University Press, Oxford.
- Oluffa Pedersen E. & Toft P. (2004)** *Positivism: Erfaringsbaseret viden formuleret i en logisk sprogform*. In: Fuglsang L. & Bitsch Olsen P. (eds.) *Videnskabsteori i samfundsvidenskaberne*. Roskilde Universitetsforlag, Copenhagen: 55–77.
- Peirce C. S. (1994)** *CP: The Collected Papers of Charles Sanders Peirce*. Electronic edition reproducing Past Masters. Hartshorne C. & Weiss P. (eds.) (1931–1935) Vols. I–VI. Harvard University Press, Cambridge; Burks A. (ed.) (1958) Vols. VII–VIII. Harvard Univer-

- sity Press, Cambridge. Intelex Corporation, Charlottesville. All quotes refer to Peirce's Collected Papers (1994) abbreviated as "CP"
- Popper K. (1972)** *Objective knowledge: An evolutionary approach*. The Clarendon Press, Oxford.
- Sharma C. (2009)** *A critical survey of Indian philosophy*. Motilal Banarsidass, Delhi.
- Spencer-Brown G. (1969)** *Laws of form*. Allen and Unwin, London.
- Spencer-Brown G. (1972)** *Laws of form*. Julien Press, New York.
- Spencer-Brown G. (as James Keys) (1974)** *Only two can play this game*. Bantam Books, New York.
- Steuchius Eugubinus A. (1972)** *De perenni philosophia, Libri X*. Paris. Johnson Reprint, New York. Originally published in 1540 in Paris.
- Stjernfelt F. (2007)** *Diagramatology: An investigation on the borderlines of phenomenology, ontology, and semiotics*. Springer, New York.
- Uexküll J. von (1982)** *The theory of meaning*. *Semiotica* 42(1): 25–82. Originally published in 1940.
- Wittgenstein L. (2001)** *Philosophical investigations*. Blackwell Publishing, Oxford. Originally published in 1953.
- Zahavi D. (2001)** *Husserl and transcendental intersubjectivity*. Ohio University Press, Ohio.
- Zahavi D. (2002)** *Husserl's phenomenology*. Stanford University Press, Stanford.

SUBMITTED: 06 MAY 2009

ACCEPTED: 30 OCTOBER 2009