

Chapter 13

Bateson and Peirce on the Pattern that Connects and the Sacred

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Abstract Classical mechanicism viewed the world as a self-sufficient machine made by God, but not a part of God or with God's presence in it. Cybernetics and information theory offers an alternative view on science to classical mechanistic physics with its mind–body dualism or eliminative materialism. The informational cybernetics of Gregory Bateson aims to change the understanding of evolution, ecology, mind and nature and the divine. Bateson developed a conception of God as an immanent informational pattern that connects everything in a cybernetic pantheism. Nevertheless Bateson's theory of "Steps to an ecology of mind" as cybernetic recursive processes did not include first person experiences and qualia. Peircean semiotics delivers a phenomenological, realistic as well as naturalistic framework. In his hylozoic theory, mind is feeling on the inside and on the outside it can be seen as spontaneity, chance and chaos with a tendency to take habits, which is the law of mind manifesting itself as thoughts. The pantheistic aspect of Peirce's philosophy is that he sees the evolutionary processes and habits of the universe as evolutionary love. But Since Peirce further argues for an emptiness from where the categories spring, he is a panentheist!

Keywords Bateson, Peirce, cybernetic God, panentheism, evolutionary love

Introduction: What Is the Pattern that Connects?

As a result of the many conflicts between medieval times and the Renaissance, science and religion (mostly in the form of Christianity) have stabilized a peaceful division of territory, where mechanistic science's "Big Bang" theory covered nature, including the human body, and religion covered the area of "the inner world" or "the soul". Subsequently, after the Enlightenment, the scientific worldview has – contrary to expectations – not been able to wipe out the idea of a metaphysics of the

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sacred and of personal and cultural values associated with the sacred at the level of civilization. Institutionalized religion is still one of the major forms of organizing and understanding the existential–phenomenological aspect of human life and science and religion are still in conflict about how to explain the origin of humans and the universe. Basically, the conflict is firstly about mind and matter, where religion explains human consciousness as a soul created by God and the sciences either wants to explain consciousness in term of material evolution and furthermore often also wants to eliminate any causal influence of first person experience on matter (including the body). Secondly it is about meaning and purpose in nature, where religion sees an intrinsic divine meaning and purpose and the sciences work from a metaphysics devoid of a concept of meaning, which again contributes to the paradigmatic conflict between the two cultures, as humanities and the social sciences have to work with meaning as a given interpersonally created (real) process.

The Cartesian dualistic metaphysics embraced by modern science forces it to look for some kind of meeting point of the inner and outer worlds to be found in the dynamics of the human brain. For medicine this is where the psychosomatic link must be. Peculiarly, the inability to find this link might be one of the reasons neurosciences and cognitive sciences have experienced such a big boom over the last decade. A knowledge-seeking-culture wants to find that connection (Penrose 1995, Searle 1986) and it is somewhat of a scandal that our capable scientific and technological culture has not done that yet. The received view of science does not understand how mind – or even life – arises in this world or is able to assert causal influence over matter in living bodies. This is one of the main problems that Peircean biosemiotics grapples with (Brier 2006a and b).

The questions are:

1. Is it possible to arrive at an understanding of man and the universe, which embraces modern science on one hand without seeing phenomenological man as a gypsy on the edge of a dead, foreign and meaningless universe (Monod 1972) on the other?
2. Is it possible to find a ‘pattern that connects’ mind, man, living nature and the universe?

This is the quest that both the semiotician Charles Sanders Peirce (1839–1914) and the cybernetician Gregory Bateson (1904–1980) boldly attempt in their life’s work in philosophy of knowledge and science. They are both truly humbling intellectual giants and daring transdisciplinary thinkers far ahead of their times; living difficult lives through their dedication to renewing the view of the West on the question of science, religion and knowing. Bateson never used Peirce’s semiotics but he came close to aspects of it in developing his theories. Both were unsatisfied with the classical mechanicism and naive realism underpinning classical physics and which underlay the conception of “science.”

Part of this problem has also been formulated by another of my intellectual heroes, Ilya Prigogine (1917–2003), in cooperation with the brilliant philosopher of science Isabelle Stengers. Prigogine and Stengers (1984) claim, that the combination of

thermodynamics and quantum physics, seen together, philosophically provides a more realistic and comprehensive worldview, than classic mechanistic. If they are correct, then spontaneity, complexity, irreversibility, time and evolution have made their entrance as basic conceptions in physics (Prigogine 1980, Prigogine and Stengers 1997). This is also true for complexity science, developed more recently.¹ It follows that it is no longer possible for classical mechanistic, reversible and deterministic natural science to uncover either nature's or matter's "inner being" in the form of a "world formula" as Laplace dream of and Stephen Hawking² still tries to make true. As new recognition of complex non-linear systems accentuates, it becomes evident that even if one knew the laws that govern a system's basic dynamics, one would not be able to understand its detailed development. The initial conditions are very crucial. Physics also realizes that no version of the Big-Bang-theory will tell us how the Universe was created, because the original "singularity" eludes scientific examination. Physical explanations do not start until after the universe has been initiated.

Both Bateson's and Peirce's philosophies of knowledge and science represents attempts to go beyond the traditional views on scientific knowledge, first person experiential knowledge of meaning and the relation of these knowledge forms to the foundations of religion and the way they cut up and partition the world of knowledge.

Bateson's Concept of Information as a Difference that Makes a Difference

As indicated, one of Bateson's (1973, 1980) major projects was explaining the nature of mind and nature – or mind in nature – from a modern scientific basis, avoiding the metaphysical dualism of Descartes as well as the mechanistic of Laplace. Through cybernetics, Bateson provides a new delimitation of the concept of information that unites in a more consistent way scientific worldviews with

¹Complexity science is not a single theory. It is highly interdisciplinary and encompasses more than one theoretical framework. Complex systems are viewed as diverse and made up of multiple interconnected elements that often interact in non-linear fashion. Complexity science is seeking answers to some fundamental questions about living, adaptable, changeable systems such as the behavior of complex adaptive systems, systems that are not only complex but also *adaptive* in that they can change and learn from experience. Systems that can learn from change include the cell and the developing embryo and the juvenile body, the brain and the immune hormone and nervous system and their mutual interaction, social insect's colonies, ecosystems and the whole biosphere, and any human social group-based cultural and social system such as manufacturing businesses, the stock market, political parties and religious sects. Principles of emergence and self-organization are essential partly borrowed from general system theory.

²*A Brief History of time* (original 1968, but with ongoing editions up to the present). Is the most popular science book ever. Hawking holds the Isaac Newton Chair at Cambridge University – and rightly so!

concepts deriving from a non-mechanistic view, primarily ethological study of cognition and communication of animals and man. “In fact what we mean by information – the elementary unit of information – is a difference which makes a difference ...” (Bateson 1973: 428). This is his key concept that ties mind and nature, and is supposed to give us the key to animal, as well as human mind and behavior.

1. Bateson’s worldview is scientific and to a certain degree materialistic,³ but not classically mechanistic, because he depends on Norbert Wiener, one of the founders of cybernetics, who developed the concepts of circular control (feedback) and goal-directed behavior and tied the theory of information to the probabilistic interpretation of entropy in thermodynamics as developed by Boltzmann and Gibbs, who is the main figure for Wiener (see 1988/1954 p. 8–12).
2. Bateson sees matter and energy is imbued with informational circular processes of differences, which creates “patterns that connect”. Deeply interested in anthropology, biology and psychology, he approaches the fields of information, cognition and communication from a cybernetic angle.
3. Bateson’s “working hypothesis” is that the world’s basic constituents are space, time, elementary particles (matter), energy and differences – and therefore informational relations.
4. He believes that science will end if we endow elementary particles with mind qualities (Bateson 1980:103).⁴
5. His project is to explain mind as a function of complexity and cybernetic organization in the way he conceived cybernetics (see below).
6. Bateson believes that the strength of cybernetics lies in its ability to provide a more profound understanding of what the mental is, by incorporating his concept of information into a universal cybernetic philosophy.
7. Bateson believes that his cybernetics can provide an understanding of mind that is neither subjectively idealistic nor mechanically materialistic.

Before we explore his theory, let me state briefly how I see Bateson’s role in developing the field and the limitations of his answers to the two questions I formulated above: Bateson helps push classical cybernetics into second-order cybernetics by leading cybernetics towards a more social and humanistic way of viewing information, cognition and communication. He comes as close to a cybernetic foundation of semiotics as did Jacob von Uexküll previously in biology (although in a different philosophical framework). In my opinion, there are two reasons why Bateson did not quite succeed: (1) He was unable to liberate his concept of information from that of Norbert Wiener. Although Bateson’s definition of information seems well suited to

³Meaning that he does not include a first person view and/or phenomenological of mind as part of his theoretical framework.

⁴“In a word, I do not believe that single subatomic particles are “minds” in my sense because I believe that mental process is always a sequence of interactions *between* Parts Several respected thinkers ... have proposed theories of evolution which assumes some mental striving to be characteristic of the smallest atoms.” (p. 103)

second-order cybernetics, he tied the definition to the concept of neg-entropy, which gives his theory a physicalistic flavor. (2) He did not develop a satisfactory cybernetic theory of the observer. This is why I find it necessary to compare him to Peirce's semiotic worldview because he deals with the problems of mind and meaning in a complete different way but with the same trans-disciplinary ambition. But his solution, when you unfold it in full, is so different and original that it will probably scare away most scientists, even many Peircean biosemioticians.⁵

Mind, Information, and Entropy

For Bateson, mind is a cybernetic phenomenon, a sort of mental ecology. The mental ecology relates to an ability to register differences and is an intrinsic system property. The elementary, cybernetic system with its messages in circuits is the simplest mental unit, even when the total system does not include living organisms. Every living system has the following characteristics that we generally call mental:

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 responding 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 a cybernetic system that is comprised 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. Mind is also immanent in the greater circuits, which complete the system "brain + body." Finally, mind is immanent in the even greater system "man + environment" or – more generally – "organism + environment," which is identical to the elementary unit of evolution, i.e., the thinking, acting and deciding agent:

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 social 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

⁵For the same reason I give a lot of original Peirce quotes in the second part of the paper to document my interpretation of Peirce.

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: 436–37).

Bateson's cybernetics thus leads towards mind as immanent in both animate and inanimate nature as well as in culture, because mind is essentially the informational and logical pattern that connects everything through its virtual recursive dynamics of differences and logical types. The theory is neither idealistic nor materialistic. It is informational and functionalistic.⁶ Norbert Wiener (1965/1948) has an objective information concept, which Bateson develops to be more relational and therefore more ecological. He develops a cybernetic concept of mind that includes humans and culture. Bateson's worldview seems biological. He sees life and mind as coexisting in an ecological and evolutionary dynamic, integrating the whole biosphere. Bateson clearly sympathizes with the ethologists (Brier 1993, 1995) when he resists the positivistic split between the rational and the emotional in language and thinking that is so important for cognitive science. He acknowledges emotions as an important cognitive process:

It is the attempt to separate intellect from emotion that is monstrous, and I suggest that it is equally monstrous – and dangerous – to attempt to separate the external mind from the internal. Or to separate mind from body. Blake noted that “A tear is an intellectual thing,” and Pascal asserted that “The heart has its reasons of which reason knows nothing.” We need not be put off by the fact that the reasonings of the heart (or of the hypothalamus) are accompanied by sensations of joy or grief. These computations are concerned with matters, which are vital to mammals, namely matters of relationship, by which I mean love, hate, respect, dependency, spectatorship, performance, dominance and so on. These are central to the life of any animal, and I see no objection to calling these computations “thought,” though certainly the units of relational computation are different from the units which we use to compute about isolable things.

(Bateson 1973: 438–39)

It thus seems obvious that Bateson's “pattern that connects” includes the phenomenological–emotional dimension in its concept of mind but viewed as computational

⁶Functionalism is a philosophical view of mind, according to which mental processes are characterized in terms of their abstract functional or even computational relationships to one another, and to sensory inputs and motor outputs. The mind should be explained in terms of the function of the human body within a given environment. Bateson expands this idea further into the environment. Its core idea is that mental states can be accounted for without taking into account the underlying physical medium such as the brain. In *the computational view* the mind is seen as the software and the brain as the hardware. As these processes are not limited to a particular physical state or physical medium, they can be realized in multiple ways. Some call it a *non-reductive materialism* others the *information processing paradigm*. It is probably the dominant theory of mental states in modern philosophy (Brier 1992 and 1999). I know that many researchers using Bateson's work do not share this understanding and find it provoking and unfair to their interpretation of Bateson's paradigm. But I find my interpretation clearly supported by the two first chapters in the posthumous published book *Angels Fear* (2005/1987), which Mary Catherine Bateson participated in and finished after her fathers dead, and it is also supported by Hayles (1999) interpretation of cybernetics and in the way Luhmann (1995) uses Bateson in his theory: The view is further developed in this article.

thoughts of relation, not as first person experiences. Cybernetics does not have a theory of qualia and emotion – not even in Bateson’s theories.

In my opinion, this cybernetic viewpoint tells a great deal about motivational and emotional functionality as seen through an ecological and evolutionary framework. It avoids physicalistic explanations, but although Bateson developed his theory far in this direction, he never revisited the first-order cybernetic foundation it was built upon. In *Mind and Nature* (1980:103) Bateson further develops his criteria for a cybernetic definition of mind:

1. A mind is an aggregate of interacting parts or components.
2. The interaction between parts of mind is triggered by difference, and difference is a non-substantial phenomenon not located in space or time; difference is related to neg-entropy and entropy rather than to energy.
3. Mental processes require collateral energy.
4. Mental processes require circular (or more complex) chains of determination.
5. In mental processes, the effects of difference are to be regarded as transforms (i.e., coded versions) of events preceding them. The rules of such transformation must be comparatively stable (i.e., more stable than the content) but are themselves subject to transformation.
6. The description and classification of these processes of transformation disclose a hierarchy of logical types immanent in the phenomena.

(Bateson 1980: 102 and Bateson and Bateson 2005 p.18–19)

Today these criteria are famous and basic within the cybernetic understanding of mind. My critique concentrates on the foundation of the second criteria: “difference is related to neg-entropy and entropy” I find it problematic that Bateson follows Norbert Wiener’s idea that the concept “information” and the concept “negative entropy,” are synonymous. He is not only thinking of the statistical concept of entropy that Shannon uses in his theory, since this is not connected to energy. Further, he thinks that this insight unites the natural and the social sciences and finally resolves the problems of teleology and the body–mind dichotomy (Ruesch and Bateson 1987/1951: 177). Regarding how the mystery of mind is resolved through the relation between the concept “information” and the concept “negative entropy” Ruesch and Bateson typically write:

Wiener argued that these two concepts are synonymous; and this statement, in the opinion of the writers, marks the greatest single shift in human thinking since the days of Plato and Aristotle, because it unites the natural and the social sciences and finally resolves the problems of teleology and the body–mind dichotomy which Occidental thought has inherited from classical Athens.

(Ruesch and Bateson 1987/1951: 177)

This statement characterizes the views of many researchers using this framework within systems, cybernetics, and informatics. To Bateson cybernetics provides a radical new foundation for a theory of mind and communication, as well as cognitive science, with a modern expression that unites the natural and social sciences. Psychology as such is not mentioned.

Shannon's theory of information, however, never had anything to do with the semantic content of messages. In a famous passage, Shannon writes the following about this problem with his theory:

The fundamental problem of communication is that of reproducing at one point either exactly or approximately a message selected at another point. Frequently the messages have meaning; that is they refer to or are correlated according to some system with certain physical or conceptual entities. These semantic aspects of communication are irrelevant to the engineering problem. The significant aspect is that they are selected from a set of possible messages.

(Shannon and Weaver 1969: 31–32)

Therefore, what people and animals conceive as information is quite different from what Shannon and Weaver's theory of information is about. Von Foerster concludes:

However, when we look more closely at these theories, it becomes transparently clear that they are not really concerned with information but rather with signals and the reliable transmission of signals over unreliable channels ...

(von Foerster 1980: 20–21)

In a conclusive analysis summarizing years of work on the concept of information in the physical sciences and information theory, Christiansen (1984) suggests that it is a materialistic reductionism to claim that one's theory of information is based upon the physical concept of entropy. Using Christiansen (1984) analysis as a tool, Bateson's theory appears to end in a materialistic short circuit. It is well known that to determine the entropy in a system, it is necessary to determine in advance what will count as macro states. Furthermore, it is necessary to determine the probability of every state in advance. There is no room for the completely unexpected (Brier 1992).

As Bateson's original definition goes, it is the observing system that determines which differences make a difference as the system proceeds in its historical drift. With this move, a cybernetic concept of mind is created that is free of any "inner world." How can one, on this basis, expect to explain will, emotion and consciousness – not to mention the semantic contents of messages? Shannon's information theory is thus a quantitative theory used on a set of messages that are presumed to be meaningful. It is a technical theory about how to quantify and mathematically model information as a tool but always operating on human social communication. As such it presents no problem. The problem arises with the reification of information by connecting it to thermodynamics, as Wiener did, that raises foundational epistemological problems that reflect back on the prerequisites for science itself. It is in accordance with the foundation of complexity science, from which theories of self-organization and emergence also try to give a solution to the ontological problems of defining life and mind. This is the place where Peirce becomes relevant in his basic shift in interpreting the basic complexity or chaos. In accordance with the above-mentioned analysis by Christiansen regarding information defined as neg-entropy, where entropy is defined as meaningless chaos.

Chaos as Peircean Firstness

Peirce sees the foundation of reality as chaotic, but his concept of chaos is developed a step further than Prigogine's thermodynamic chaos, based as it is on Boltzmann and Gibbs just like the cybernetics of Wiener and Bateson. Peirce (1891, 1892) theorizes that randomness or chaos must necessarily precede lawfulness and determination in an evolutionary philosophy because chance in relation to the basis of any law can only be defined in a purely negative sense such as the absence of law, or the absence of knowledge about the laws behind seemingly chaotic processes – as in deterministic chaos. But Peirce's chaos is not a deterministic chaos.

In agreement with modern thermodynamics and to some degree with quantum field physics, Peirce sees the basic quality of reality as randomness or chaos. But he elucidates some important philosophical ontological consequences from this view: if chaos is basic, one cannot explain it as the absence of law, because chance or randomness precedes law. Thus one must explain law from randomness, not the reverse. Chaos, chance, and randomness must therefore be understood not only as emptiness but also as fullness, as a hypercomplex of dynamic processes that include characteristics of mind, matter, and life.⁷ He calls this pure spontaneity:

To undertake to account for anything by saying boldly that it is due to pure chance would indeed be futile. But this I do not do. I make use of chance chiefly to make room for a principle of generalization, or tendency to form habits, which I hold has produced all regularities. The mechanical philosopher leaves the whole specification of the world unaccounted for, which is pretty near as bad as boldly attribute it to chance. I attribute it altogether to chance it is true, but to chance in a form of spontaneity which is to some degree regular.

(Peirce 1994: 6.63)

To explain how law and structure emerge from randomness, Peirce endows chaos with one more quality, namely the tendency to form habits. In order to impart meaning to this philosophy, we must comprehend chaos as spontaneously dynamic with the tendency to form habits. "Symmetry breaking" is the more modern scientific term for the same phenomenon, and is used in both quantum field physics and thermodynamics. If we accept that the concept of chaos is as fundamental as that of natural law, then we should not conceive of chaos as the absence of regularity or the absence of the ability to create structures. It should be viewed, rather, as a hyper-complexity of potential structures and potential information in an infinite, living dynamic. It could thus be possible to transcend the dilemma between determinism and indeterminism; because with Peirce one can understand the creation of law from chance as "habits of nature." The laws of nature are exact only in their mathematical descriptions, whereas the measurements on which they are based are always influenced by uncertainties. The laws are only approximate model descriptions of a far richer and more varied, spontaneous and living reality.

⁷In itself this observation is compatible with Wiener and Bateson's cybernetic ontology.

Peirce's argues that if chaos is the fundamental concept, then law is unusual and unexpected, and therefore the thing to explain, not the reverse. From the perspective of the statistical information of Shannon and Weaver there is maximal information in chaotic random behavior. But this is not Peirce's point of view. For him, departures from the random are interesting because they provide knowledge about structures and law-like behavior. It is exactly this absolute and deterministic nature of physical law that Peirce disputes:

The law of habit exhibits a striking contrast to all physical laws in the character of its commands. A physical law is absolute. What it requires is an exact relation. Thus, a physical force introduces into a motion a component motion to be combined with the rest by the parallelogram of forces; but the component motion must actually take place exactly as required by the law of force. On the other hand, no exact conformity is required by the mental law. Nay, exact conformity would be in downright conflict with the law; since it would instantly crystallize thought and prevent all further formation of habit. The law of mind only makes a given feeling more likely to arise. It thus resembles the 'non-conservative' forces of physics, such as viscosity and the like, which are due to statistical uniformities in the chance encounters of trillions of molecules.

The old dualistic notion of mind and matter, so prominent in Cartesianism, as two radically different kinds of substance, will hardly find defenders to-day. Rejecting this, we are driven to some form of hylopathy, otherwise called monism.

(Peirce 1891: 321; 1994 6, 23.24)

By positing law emerging from the random and cosmos emerging from chaos as the habits of the universe come into being, the creation of the universe and our own world melt together in a way that the new cybernetics and constructivism have been pursuing for some time. Like Wiener, and Ruesch and Bateson, Peirce sees this basis as a possible foundation for a kind of monistic view of matter and mind. As Peirce noted, it is necessary to transcend the fruitless antagonism between idealism and materialism:

On the other hand, by supposing the rigid exactitude of causation to yield, I care not how little it be but a strictly infinitesimal amount – we gain room to insert mind into our scheme, and put it in the place where it is needed, into the position which, as the sole self-intelligible thing, it is entitled to occupy, that of the fountain of existence; and in so doing we resolve the problem of the connection of soul and body.

(Peirce 1892a: 335)

Here we see Peirce move in another direction than the cyberneticist and the received view of the "scientific world view" in inserting mind at the fountain of existence, though he has still not reveal what his concept of mind is. Peirce realizes that such ontology must include a view of the "creation of the world" that does not conflict with our present scientific knowledge, He writes:

It would suppose that in the beginning, – infinitely remote, – there was a chaos of unpersonalized feeling, which being without connection or regularity would properly be without existence. This feeling, sporting here and there in pure arbitrariness, would have started the germ of a generalizing tendency. Its other sportings would be evanescent, but this would have a growing virtue. Thus, the tendency to habit would be started; and from this with the other principles of evolution all the regularities of the universe would be evolved. At any time, however, an element of pure chance survives and will remain until the world becomes an absolutely perfect, rational, and symmetrical system, in which mind is at last crystallized in the infinitely distant future.

(Peirce 1891: 170)

This statement agrees with classical equilibrium thermodynamics and modern physical cosmology – Big Bang theory and the super string theory – that theorizes the universe as arising from a random sporting in the vacuum field. It begins very small, but expands rapidly, thereby unfolding space–time. Radiation and matter form through symmetry-breaking. Through dissipative structures, matter self-organizes into more complicated structures. The difference between Peirce’s perspective and that of modern science is that most modern physicists believe that chaos is non-living and non-mental and that this view is necessary ontology for the possibility of science in general, understood as the search for objective real universal natural laws governing all processes in nature. For this reason I believe that Peirce’s theory of basic reality as a hyper-complexity of living feeling with the tendency to form habits is a good supplement to Bateson’s, as well as Maturana and Varela and Luhmann’s – theories of information, communication, knowing and languaging. I see here a theoretical connection between second-order cybernetics and semiotics that will strengthen both theories.

Cybernetic information theory works with differences in a dualistic system. Information is a difference that makes a difference, was Bateson’s definition. But differences only make a difference in a system that somebody has coded from some sort of individual, social or species interest. A code only gives meaning to differences or information in certain contexts. A code is a set of process, rules, or habits that connects elements in one area with elements in another area in a systematic way in a specific meaning context. The correspondence is not a universal natural law, but is local and motivated from a living signifying system. A sequence of differences such as the base pairs in DNA or dots in the Morse-alphabet can be information for coding, but is not a code in itself. Living systems functions are based on self-constructed codes. Machines do not make codes themselves.

Codes are triadic sign processes, where an Interpretant makes the motivated connection between objects and signs (representamens). Logical patterns and types do not have meaning in themselves. The logic of the living includes meaning, emotions, ethics and aesthetics. Thus you need a triadic concept of signification to get to a concept of code plus a concept of first person experiences.⁸ A sign is always useful for the system emitting it in some way (also if it is deceptive). Its value can be determined by its contribution to the reproductive and procreative value and/or pleasure of the entire system. A Peircean biosemiotic argument on why cybernetic information as differences is not enough, would then be that semiosis is a crucial part of those processes that makes systems living and thereby lifts them out of the physical world of efficient causality through the informational realm of formal causality in chemistry into the final causation in semiotic processes.

⁸This is where I differ from Marcello Barbieri’s theory in that he believes a theory of biological meaning is possible without Peircean semiotics (Barbieri 2006). I do not think he is able to answer the further questions of how cognition, meaning and interpretation can arise in living systems and first person experiences come into existence, without a Peircean philosophical and semiotic framework. A further analysis and argumentation can be found in 2006 a and b and a forthcoming paper: “The Paradigm of Peircean biosemiotics”.

Bateson, like Peirce, wants to develop a relational logic, and wants, like Spencer-Brown, to include Laws of Form (1972). Niklas Luhmann (1995) includes them both in his socio-communicative socio-cybernetic theory of society and its functionally differentiated systems. Therefore my critique of Bateson here can be transferred to Luhmann's theory also. Bateson's move is to reduce the phenomenological to the cybernetic. But thereby the access to first person experience is lost. As Short writes:

The subject or sign-interpreter is essential to semiosis. Without the subject, there is no sign interpretation; and without the possibility of interpretation, grounded in some relation of sign to object, there is no sign. Hence, without the possibility of a subject, there is no sign. And there cannot be a conventional relation of sign to object without subjects who established that convention.

(Short 1982, s. 116–117)

The problem is, that theoretically there are no subjects in cybernetics (Brier 2006a and b), as Luhmann underlines in his theory (Luhmann 1995). Not even the observer of second-order cybernetics is a theoretical subject. There is no theoretical concept of experience and subjectivity as in phenomenology. Therefore no living subjective Interpretant.

The Basis of Peircean Triadic Semiotics

Semiotics is also defined as the study – or doctrine – of signs and sign systems, where sign systems are most often understood as co-evolved with the evolution of codes. Language of course depends on social and cultural codes. Examples of biological codes are the codes for the reception and the effects of hormones and neurotransmitters on various tissues, which are obvious biological sign systems. Peircian semiotic builds on Peirce's unique triadic concept of semiosis, where the 'interpretant' is the sign concept in the organism that makes it see/recognize something as an object. The Interpretant is the individual interpretation of what the Representamen or the outer sign vehicle "stands for." Meaning is the motivated context in which the relation between the Object and the Representamen is seen. This is the code that connects them in a specific functionality.

Peircian semiotics is founded on his Phenomenologically based theory of consciousness as founded in his theory of "pure feeling" unlike Bateson's mind that is third person cybernetic information processes.⁹ But like Bateson's mind, the pattern that connects Peirce's categories, is both inside and outside our heads and all living systems. Mind exists in the material aspect of reality (in Secondness) as the 'inner

⁹This is the crucial difference between the two theoretical systems in my interpretation. It is not that Bateson did not believe in the reality of emotions, but in his theoretical system – consistent with cybernetics in general – they are only represented and functions as dynamic informational patterns.

aspect of matter' (a view called 'hylozoism'). Mind manifests as awareness and experience in animals and, finally consciousness in humans. In this way Peirce makes a philosophy where mind and the mechanical paradigm of classical science can exist together. The price for the mechanical paradigm is that it becomes only a metaphysical frame that works for a limited selection of systems, and not a fundamental reality. As a consequence the laws of nature that it finds are not fundamental laws from, which everything, including mind, is to be understood. These laws only pertain (as good approximation) to some kinds of systems and then even only as approximations. They are in reality not exact! Peirce places mind as pure feeling in Firstness. We might imagine Firstness as being placed behind Prigogines Paradigm, thus enabling the complexity and self-organizing paradigm of thermodynamics work for a limited number of systems, where mind is still not dominant in causal effects. He writes:

Hence, it would be a mistake to conceive of the psychical and the physical aspects of matter as two aspects absolutely distinct.

Viewing a thing from the outside, considering its relation of action and reaction with other things, it appears as matter. Viewing it from the inside, looking at its immediate character as feeling, it appears as consciousness.

These two views are combined when we remember that mechanical laws are nothing but acquired habits, like all the regularities of mind, including the tendency to take habits, itself; and that this action of habit is nothing but generalization, and generalization is nothing but spreading of feelings. (Peirce 1994: 6.268)

Peirce then works with three types of causality that he has distilled out of his work with Aristotle, but now places in his own evolutionary semiotic framework. (1) Efficient causality works through the transfer of energy and is quantitatively measurable. (2) Formal causality works through pattern fitting, differences and with signals as information in a dualistic proto-semiotic matter. (3) Final causation is semiotic signification and interpretation. Peirce explains how to understand the concept of final causation in his paradigm, which is different from Aristotle's on one hand and the received view in psychology.

It is ... a widespread error to think that a "final cause" is necessarily a purpose. A purpose is merely that form of final cause which is most familiar to our experience.

... we must understand by final causation that mode of bringing facts about according to which a general description of result is made to come about, quite irrespective of any compulsion for it to come about in this or that particular way; although the means may be adapted to the end.

The general result may be brought about at one time in one way, and at another time in another way. Final causation does not determine in what particular way it is to be brought about, but only that the result shall have a certain general character.

(Peirce, 1994: 1.211)

In Peirce's semiotic philosophy production of meaning is brought into "dead" nature – as mechanism would call it – by the concepts of Firstness and synechism, combined with hylozoism and the development of the universe through the three different kinds of evolution: (1) Thycistic (free or random variation). (2) Anachastic (dynamic dyadic interactions, a more mechanical necessity like Darwin's natural selection). (3) Agapistic (combining the free variation with the dyadic interactions

trough habit formation by the mediating ability of Thirdness). This is the law of mind. The Law of Mind is what he calls Evolutionary Love in his philosophy. He writes:

... the formula of an evolutionary philosophy, which teaches that growth comes only from love, ... from the ardent impulse to fulfill another's highest impulse this is the way mind develops; and as for the cosmos, only so far as it yet is mind, and so has life, is it capable of further evolution. Love, recognizing germs of loveliness in the hateful, gradually warms it into life, and makes it lovely. That is the sort of evolution which every careful student of my essay "The Law of Mind" must see that synechism calls for.

Peirce Evolutionary Love (6.289)

Organisms are governed by final causality in the sense of their tendency to take habits and to generate future interpretants of the present sign actions. Codes in living systems are correspondences based on final causation that cannot be inferred directly from natural laws. They are based on the formal causation of the pro- tosemiotic differences and pattern fitting information mostly on the chemical level of interaction. The physical interactions are based on laws and efficient causation of energy transfer.

Peircean Scientific Mysticism

In the article "A neglected argument for God", Peirce contends that the very first step in abductive reasoning is a form of Pure Play, which he calls Musement. This first stage of abduction is to be undergone without rules or restrictions. There should be no censorship as to what can or cannot be considered. To that end you need a positive attitude towards the world and the possibility of knowledge, as a pessimistic outlook would eliminate the 'open' mind attitude. There are all sorts of relations you are not at liberty to investigate if you have decided a priori that they are not worth making. Chiasson (1999) ends her analysis of neglected argument for God in the following way:

From this criterion, perhaps we could say that we could redefine Peirce's use of the word God into: any hypothesis – formed by means of optimistically undergone abductive reasoning – that leads one into consciously choosing ethical conduct that results in the living of a good life – whether or not the concepts we know as God or an after-life enter into the matter at all.

(Chiasson 1999)

The pursuit of scientific knowledge for the benefit of mankind is seen as a sort of holy quest. Knowledge thus has its origin in the divine stability of the world. As in Descartes, Peirce sees the divine as the guarantee against total skepticism, but in an evolutionary non-mechanistic framework. Peirce goes much further in his evolutionary Agapistic metaphysics. He writes in the Monist paper "Evolutionary Love:"

Everybody can see that the statement of St. John is the formula of an evolutionary philosophy, which teaches that growth comes only from love, from I will not say self-sacrifice, but

from the ardent impulse to fulfill another's highest impulse. Suppose, for example, that I have an idea that interests me. It is my creation. It is my creature; ...it is a little person. I love it; and I will sink myself in perfecting it. It is not by dealing out cold justice to the circle of my ideas that I can make them grow, but by cherishing and tending them as I would the flowers in my garden. The philosophy we draw from John's gospel is that this is the way mind develops; and as for the cosmos, only so far as it yet is mind, and so has life, is it capable of further evolution. Love, recognizing germs of loveliness in the hateful, gradually warms it into life, and makes it lovely. That is the sort of evolution which every careful student of my essay "The Law of Mind" must see that synechism¹⁰ calls for.

(Peirce, 1994: 6.289)

In Peirce's philosophy, the production of meaning is brought into what mechanism sees as "dead" nature by the concepts of Firstness and Synechism combined with hylozoism and the development of the universe through the combination of the three different kinds of evolution: Evolution by fortuitous variation (tychasm), or evolution by mechanical necessity (anacasm), or evolution by creative love (agapism). But it is with Peirce as it is with St. John, of those true love is the greatest and the most profound. He writes:

Evolution by sporting and evolution by mechanical necessity are conceptions warring against one another. Lamarckian evolution is thus evolution by the force of habit ... Thus, habit plays a double part; it serves to establish the new features, and also to bring them into harmony with the general morphology and function of the animals and plants to which they belong. But if the reader will now kindly give himself the trouble of turning back a page or two, he will see that this account of Lamarckian evolution coincides with the general description of the action of love, to which, I suppose, he yielded his assent.

(Peirce, 1994: 6.301)

Further we must keep in mind that matter is "effete mind". The three categories are connected through the "pure feeling" of Firstness. Thus "the Law of Mind" also breaks up habits of matter.

Remembering that all matter is really mind, remembering, too, the continuity of mind, let us ask what aspect Lamarckian evolution takes on within the domain of consciousness ... the deeper workings of the spirit take place in their own slow way, without our connivance ... Besides this inward process, there is the operation of the environment, which goes to break up habits destined to be broken up and so to render the mind lively. Everybody knows that the long continuance of a routine of habit makes us lethargic, while a succession of surprises wonderfully brightens the ideas A portion of mind, abundantly commissured to other portions, works almost mechanically. It sinks to a condition of a railway junction. But a portion of mind almost isolated, a spiritual peninsula, or cul-de-sac, is like a railway terminus. Now mental commissures are habits. Where they abound, originality is not needed and is not found; but where they are in defect spontaneity is set free. Thus, the first

¹⁰Peirce held that the continuity of space, time, ideation, feeling, and perception is an irreducible (philosophical ontological) foundation of science, and that an adequate conception of the continuous is an extremely important part of all the sciences. This doctrine he called "synechism," a word deriving from the Greek preposition that means "together with". Peirce was least one of the first scientific thinkers, to argue in favor of the actual existence of infinite sets. Not only did Peirce defend infinite magnitudes, but also he defended infinitesimal magnitudes. See <http://plato.stanford.edu/entries/peirce/#syn>.

step in the Lamarckian evolution of mind is the putting of sundry thoughts into situations in which they are free to play.

(Peirce, 1994: 6.302)

This, of course, relates back to his epistemology of Abduction founded in “Pure Play”. It is the “Lamarckian” development of mind that makes science as a collective enquiry possible at all. Thus in Peirce’s philosophy, the categories work according to the “law of mind” and there is an inner aspect of Firstness (pure feeling) in matter. But one has to be aware of Peirce’s special conception of mind and consciousness. He writes:

Far less has any notion of mind been established and generally acknowledged which can compare for an instant in distinctness to the dynamical conception of matter. Almost all the psychologists still tell us that mind is consciousness. But ... unconscious mind exists. What is meant by consciousness is really in itself nothing but feeling.... there may be, and probably is, something of the general nature of feeling almost everywhere, yet feeling in any ascertainable degree is a mere property of protoplasm, perhaps only of nerve matter. Now it so happens that biological organisms, and especially a nervous system are favorably conditioned for exhibiting the phenomena of mind also; and therefore it is not surprising that mind and feeling should be confounded.... that feeling is nothing but the inward aspect of things, while mind on the contrary is essentially an external phenomenon.

(Peirce, 1994: 7.364)

Thus, the essence of consciousness is feeling and an important aspect of Firstness is pure feeling. You may then reinterpret the mystical theory of the possibility of being aware on other levels in a Peircean framework as the possibility of being aware of the basic Firstness uniting all manifest things. The universe is permeated with Firstness as Mind, but that is not the same thing as human awareness. Though a consistent theory of evolution has to point to it, as the origin of human consciousness, Peirce writes.

What the psychologists study is mind, not consciousness exclusively consciousness is a very simple thing not ... Self-consciousness ... consciousness is nothing but Feeling, in general, – not feeling in the German sense, but more generally, the immediate element of experience generalized to its utmost. Mind, on the contrary is a very difficult thing to analyze. I am not speaking of Soul, the metaphysical substratum of Mind (if it has any), but of Mind phenomenally understood. To get such a conception of Mind, or mental phenomena, as the science of Dynamics affords of Matter, or material events, is a business which can only be accomplished by resolute scientific investigation.

(Peirce, 1994: 7.365)

Peirce is not speaking of human self-consciousness but of the essence of consciousness as a phenomenon that develops in nature to emerge in new and more structured forms in living beings, nervous systems and language-based culture. He wants western science to study it, to take phenomenology seriously, and also the phenomenology lying within Eastern philosophies, of which he had studied Buddhism the most. Being an objective idealist, Peirce argues for a scientific study of mind seen as a foundational aspect of reality. This is not possible for the mechanistic science that starts off with fixed and dead laws that cannot develop and cannot encompass either emotions or free will as causal powers. Peirce writes about this concept of thought, understood as a function of mind and semiosis:

Thought is not necessarily connected with a brain. It appears in the work of bees, of crystals, and throughout the purely physical world; and one can no more deny that it is really there, than that the colors, the shapes, etc., of objects are really there. Not only is thought in the organic world, but it develops there. But as there cannot be a General without Instances embodying it, so there cannot be thought without Signs. We must here give "Sign" a very wide sense, no doubt, but not too wide a sense to come within our definition.

(Peirce, 1994: 4.551)

Here Peirce is widening the semiosis concept to include chemical pattern-creating processes as nature's thinking. I would prefer to call these proto- or quasi-semiotic processes to avoid a too broad sense of the concept leading into a pan-semiotic metaphysics. But, nevertheless, Peirce's metaphysics operates with the "inside" of material nature. He writes:

Wherever chance-spontaneity is found, there in the same proportion feeling exists. In fact, chance is but the outward aspect of that which within itself is feeling.

(Peirce, 1994: 6.265)

I find it compatible with an interpretation of Peirce's theory and in accordance with Perennial Philosophy's mysticism (Stace 1960) to see the living systems, most of all, the human, as the way in which the universe is becoming aware of itself. Evolution is the development of self-organization of systems until they become closed and thereby individuals with own intentions. One needs a body and a nervous system to become (self)-conscious! As Peirce writes:

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 1994: 6.489)

Thus, Peirce's concept of God is first and most basic an abstract transcendental origin and continuity "behind it all". God does not appear as a manifest person, as is the basis for much personal worship in so many religions including Christianity. God in Peirce's philosophy is a state of "utter nothingness" like the Godhead of Meister Eckhart (Eckhart 1941) and the emptiness of the Buddhists, as it manifests as an immanent order and "drive" in evolution. It reminds us somewhat of Hegel's "spirit", but again in a different metaphysical framework, where evolution and scientific thinking is integrated in a model that deviates from the Greek Logos thinking and has a triadic semiotic turn to the dialectics of evolution. In trying to give some hints about what pragmatism¹¹ is and how it can be used on the highest metaphysical principles, Peirce sums up his general view of cosmic evolution in the following way:

¹¹ Pragmatism is Peirce's special term to defend his original idea of pragmatism, which he found that both William James and John Dewey had misconstrued and which Richard Rorty's later development and – even more anti-foundational and anti-metaphysical and some would also say anti-rational – development of American pragmatism runs contrary to (Haack, S. 2000). The rest of the paper lays out some of the metaphysics of Peirce's pragmatism.

A disembodied spirit, or pure mind, has its being out of time, since all that it is destined to think is fully in its being at any and every previous time. But in endless time it is destined to think all that it is capable of thinking. Order is simply thought embodied in arrangement; and thought embodied in any other way appears objectively as a character that is a generalization of order, and that, in the lack of any word for it, we may call for the nonce, "Super-order." It is something like uniformity. Pure mind, as creative of thought, must, so far as it is manifested in time, appear as having a character related to the habit-taking capacity, just as super-order is related to uniformity perfect cosmology must ... show that the whole history of the three universes, as it has been and is to be, would follow from a premiss which would not suppose them to exist at all But that premiss must represent a state of things in which the three universes were completely nil. Consequently, whether in time or not, the three universes must actually be absolutely necessary results of a state of utter nothingness. We cannot ourselves conceive of such a state of nility; but we can easily conceive that there should be a mind that could conceive it, since, after all, no contradiction can be involved in mere non-existence.

(Peirce, 1994: 6.490)

In the last quote Peirce also touches upon the necessity of a generalization of order as the drive behind the evolutionary processes of the three basic categories. This "pull" towards a super order seems to be the final causation of the evolution of the universe. It "urges" to embody its thoughts in manifest creation. Or as Plato puts it in *Timeios*: The One's desire to share its love and perfection with the imperfect. It "flows over" from the transcendent into the relative and manifest in time and space creating matter as "effete" mind. The last is a Peircean formulation.

The paradox is that such a transcendent order cannot be formulated in any human language. David Bohm (1983) discusses the same consequences of his own ideas of Wholeness and the Implicate Order; which is the title of his famous book where he works with the idea of an immanent order in nature that produces the "holomovement". This is his conception of evolution. Subsequently, in an interview, he talks about the "super implicate order", which seems very similar to Peirce's "disembodied spirit" that has its existence out of time (Weber 1972). Like the Buddhists, Peirce sees this order as nothing, an emptiness.

Peirce writes that the three worlds, Firstness (qualia and potentialities), Secondness (resistance, will and brute force) and Thirdness (mediation, understanding and habit-taking) must evolve from this transcendental basis in an evolutionary metaphysics. There is a transcendental reality beyond time and space that cannot be spoken of but, still, it is somehow the source of everything. Why is it necessary? Peirce explains:

For all Being involves some kind of super-order. For example, to suppose a thing to have any particular character is to suppose a conditional proposition to be true of it, which proposition would express some kind of super-order, as any formulation of a general fact does. To suppose it to have elasticity of volume is to suppose that if it were subjected to pressure its volume would diminish until at a certain point the full pressure was attained within and without its periphery. This is a super-order, a law expressible by a differential equation. Any such super-order would be a super-habit. Any general state of things whatsoever would be a super-order and a super-habit.

(Peirce, 1994: 6.490)

Thus logic of the idea of things having universal properties demands a logos as universal foundation. The big question is then, how does evolution start from there?

Plato writes in *Timeios* that the ‘One’ overflows by love to create something that can contain at least some love in an imperfect way, as it is not jealous. In the Vedas it is desire that makes Brahman create the world through his Shakti (female force of creation). Brahman is in itself the unmovable foundation. In Christianity it is the Holy Ghost that acts in creation on behalf of “The Father”. Peirce’s solution is close to these, but formulated within his own metaphysics and, therefore, much closer to a view and a wording acceptable from a scientific viewpoint of, for instance, quantum field theory:

In that state of absolute nility, in or out of time, that is, before or after the evolution of time, there must then have been a *tohu bohu* of which nothing whatever affirmative or negative was true universally. There must have been, therefore, a little of everything conceivable. There must have been here and there a little undifferentiated tendency to take super-habits. But such a state must tend to increase itself. For a tendency to act in any way, combined with a tendency to take habits, must increase the tendency to act in that way. But there are some habits that carried beyond a certain point eliminate their subjects from the universe Thus a tendency to lose mass will end in a total loss of mass. A tendency to lose energy will end in removing its subject from perceptible existence.

(Peirce, 1994: 6.490)

Clearly, we move over into Firstness as soon as the tendency to take habits has some differences to work on that will not self-destruct. Thus the Big Bang theory does not tell us how the world was created. It is an attempt to tell us about the physical development of time, space and energy. Transcendence¹² breeds immanence¹³ and immanence makes the distinction to transcendence “before” time and “outside” space in an ever ongoing process of being

To return to the beginning of this article, it is possible to understand Peirce’s “neglected argument for God” through the “musing” of “pure play” in the light of his philosophy. Peirce is a *synechist* – as Michael Raposa (1989) points out – since he considers the Divine as both immanent and as well as transcendent and to be connected in a continuum; whereas others either denies the transcendent – as Bateson or Deleuze – or has assert an absolute dualism like Descartes, so that interaction between the two world becomes a mystery.

For Peirce, to make valuable abductions, the scientist must in a positive way open his mind to the basic creative dynamics of both mind and matter. Many mystics speak of “emptying” the mind, “being simple”, “going beyond the ego” and “letting God in”. But this is not to be understood as divine and intentional messages from a personal God or the perception of some ready made and exact transcendental ideas. It is rather a listening to the hum of creation or the general or basic vibration of the Godhead, flowing “into” time, space, life and mind and back again into its own

¹²Transcendent – a philosophical and theological concept – is that, which is beyond our senses and experience; existing apart from matter. “It” is beyond and outside the ordinary range of human experience or understanding. In theology, the concept transcendent is, pertaining to God as exalted above the universe.

¹³Immanence is a theological and philosophical concept. It is derived from the Latin words, ‘in’ and ‘manere’, the original meaning being “to exist or remain within”.

“nothingness” in that fundamental vibration that upholds our reality (according to much mystical theory). This is a version of the philosophy called pantheism.¹⁴ As Suzuki (2002: 9) points out, God in this conception is not only pantheistic or transcendental, but both, and thereby the concept covers infinitely more.

This theory lifts theories of knowledge and nature out of determinism. We cannot give a final deterministic description of nature, culture, or the knowledge process. Thus knowing is much more than knowledge. Human knowing is a processual flow. It is only by giving yourself up into this sporting of musement, as Peirce calls it, by leaving behind any limits imposed by previous knowledge and skeptical attitudes that you can hope to abduct basic and universal knowledge.

Although Peirce did have a mystical experience (Brent 1998), his major path to the divine insight was clearly through science (as he understood it). Where Plato and Descartes believed in transcendental ideas that our mind could contemplate in the highest and most divine status of mind, Peirce’s abductions, with a basis in Musing, gives an evolutionary view on the basic source of fallible human ideas and intuition, to be tested, or falsified as Karl Popper called it much later. The basic ideas and qualia in Firstness are vague and can only be manifested through the collective dynamic processes of science. This is the collective effect of being logical and permitting further empirical testing the ideas or hypothesis through induction and deduction.

Our understanding is not ready made and fixed but fallible and has to be tested and developed through human scientific practice. Thus, although Peirce’s musing can be seen as a technique of mystical revelation, it is not about forgetting real life in the ultimate divine existentiality, but a rich inspiration in building a common cultural understanding of reality.

Peirce says that Firstness is vague. It is only being; not existence in the same way as Secondness is “existence”. Qualisigns need signs of Secondness to be manifest. Peircean philosophy thus has a mystical metaphysical foundation. Like Aristotle develops a philosophy of science on a mystical metaphysical foundation. But Peirce’s “logos” is vague; it is evolutionary, taking habits and thus creating Thirdness. With his theory of abduction, Peirce’s places himself between Plato and Aristotle. It is our access to the divine that inspires our understanding of the material world through abduction. Contrary to Aristotle, Peirce sees that induction is fallible because the ideas are vague and the laws of nature not exact. We have to deduct tests from our abductively created theories and then make inductions from these tests to make our beliefs firm. Nevertheless Peirce does not doubt that we

¹⁴ Pantheism is the belief that the divine is in all things and unifies all things, but is ultimately greater than all things. It is an understanding of all creation as existing in God, yet without negating the transcendence of God. A version of it, which is close to Peirce’s philosophy, is holding that the world and God are mutually dependent upon one another for their fulfillment. Peirce points out that God cannot be conscious the same way as humans as it/he/she does not have a body. It is then through the development of structures and processes in time and space that God can become conscious. See Clayton and Peacocke (2004) for one of the latest and most interesting reflections on Pantheism in a scientific world.

advance in thinking all the time, and that everything about the world can be known given time enough, given dedicated groups of people searching for the right way of thinking, and through developing the logic of semiotics towards the summum bonum of all.

Thus in spite of what most scientist and philosophers would think we still end up with fallible science as the most important road to knowledge and evolving towards truth. This in spite of Peirce having a world view opening to mind, consciousness and the Divine as part of reality – an interesting perspective in these times where science, religion and democracy clashed again threatening world peace. Let us sum up the positions, the conflict and Peirce's solution.

Cybernetic Ecologism versus Semiotic Panentheism

For Bateson, mind cannot exist without matter while matter without mind can exist but is inaccessible. To him mind is recursive patterns of information and logical types in a dynamic hierarchy of Chinese boxes. His worldview is a mind-ecology based on differences that makes a difference (information). The framework is Norbert Wiener's cybernetic statistical thermodynamically concept of information as neg-entropy and therefore order. Wiener builds on Gibbs probabilistic paradigm of thermodynamics (developed from Boltzmann) and complicated phase-space mathematical models. In a Gibbs world view order is the mystery: The pattern that connects. Chaos is instable and collapses into order. What cybernetics adds to the scientific world of force, energy and mass is the virtual world of information-dynamics, which Bateson struggles to find a way to integrate with the classical view of science and its realistic and materialistic view of the world. Bateson called the old physical aspect of the world Pleroma. To keep us "From Single Vision and Newton's Sleep," as William Blake said, he developed Wiener's virtual informational aspect calling it *Creatura*. *Creatura* is an aspect of Pleroma, like the process of drawing a map, i.e., extracting features holding the same relations as features of the territory, but without ever producing the exact equivalent of the relations pertaining to the territory mapped.

Therefore Bateson insisted on the possibility and desirability of a science of epistemology and a scientific aesthetics! Cybernetic science, which is also a science of codes, is seen as the key to such a deep non-mystical knowledge of the relation between us, mind, ecology and evolution! This is the pattern that connects. This pattern of order is in the virtual world of *Creatura* within Pleroma. It is a dynamic order of logical types, which he saw as the basic grammar in a kind of cybernetic language. This dynamics is cybernetic mind, which is the pattern that connects all living systems. Mind is in all of nature from the brain to the ecosystem, from the species to the whole biosphere. The combination of differences, from chaos and structures with the energy flow plus the auto-catalytically recursive tendency of 'cybernetic mind', is what drives evolution. Against mysticism and spiritualism Bateson puts his 'Lonely Skeleton of Truth' as he calls it, which is this

cybernetic thermodynamic, evolutionary and ecological mind of recursively dynamic logical types. Here is Bateson's poem he wrote after completion of *Mind and Nature* (Bateson and Bateson 2005/1987:6):

The manuscript

So there it is in words
 Precise
 And if you read between the lines
 You will find nothing there
 For that is the discipline I ask
 Not more, not less
 Not the world as it is
 Not ought to be –
 Only the precision
 The skeleton of truth
 I do not dabble in emotions
 Hint at implications
 Evoke the ghosts of old forgotten creeds.
 All that is for the preacher
 The hypnotist, therapist and missionary
 They will come after me
 And use the little that I said
 To bait more traps
 For those who cannot bear
 The lonely
 Skeleton
 of Truth

This cybernetic mind¹⁵ also rules our emotions as a relational logic. It shows up in our perception as aesthetics. It is the learning pattern in evolution. Wisdom is to know and live the pattern of evolutionary and ecological wholeness in cultures as well as in individual awareness. The pattern that connects can be understood as a metaphor for what many nature-religions or spiritual types of ecologism, or Gaia-thinking, sees as the sacred or the divine. But this non-manifest dynamic pattern is an immanent deity. This is the sacred. The Creatural deep code aspect of reality! But there is no transcendence! Mind is in nature – nature is in mind – mind is in culture and therefore our cultural thinking is deeply connected to nature. What we think about nature is vital for our survival! With a wrong theory of nature and the pattern that connects our cultures chance of survival is like a snowball in hell.

¹⁵ Based on M. C. Bateson's introduction to *Angels Fear*, where she quotes the poem. I interpret that 'The Lonely Skeleton of Truth' is a metaphor for his cybernetic steps to an ecology of mind, which I also see as his answer to what is 'the pattern that connects'. On p. 12 G. Bateson writes about the rules of his work: "... in scientific explanation, there should be no use of mind or deity, and there should be no appeal to final causes. All causality should flow with the flow of time, with no effect of the future upon the present or the past. No deity, no teleology, and no mind should be postulated in the universe that was to be explained."

Thus immanence and pantheism unites Peirce and Bateson although their concepts of the divine are very different. Both place mind as immanent in nature and humans as well as in all living systems. Both see it as important for evolution and the development of cognition and learning. The underlying immanent pattern and dynamics of the mind is seen as the sacred. But it is The Lonely (logical) Skeleton of Truth versus The law of Mind and Evolutionary love, which is very central to modern discussion about what the role of science is in society and in relation to philosophy and religion. In Peirce's theory there is an experiencing inside aspect of the law of mind. Peirce writes about this:

But all mind is directly or indirectly connected with all matter, and acts in a more or less regular way; so that all mind more or less partake of the nature of matter Viewing a thing from the outside; considering its relations of action and reaction with other things, it appears as matter, Viewing it from the inside, looking at its immediate character as feeling; it appears as consciousness.

... a general idea is a certain modification of consciousness, which accompanies any regularity or general relation between chance actions.

The consciousness of a general idea has a certain 'unity of the ego,' in it, which is identical when it passes from one mind to another. It is, therefore, quite analogous to a person; and indeed, a person is only a particular kind of general idea a person is nothing but a symbol involving a general idea; ... every general idea has the unified living feeling of a person.

(Peirce 1923, *Chance, Love and Logic*, 253,260–65 here after Brent 1998:214)

From this reflection springs his famous theory of the person as a sign, primarily a symbol in the greater scheme of mind and general ideas. To understand this, one has to remember the philosophical framework from which the concepts derive their meaning. Peirce is a pantheist. The divine or the suprasensible – as Brent (1998:214) calls it – is represented in the sensible. This is an aspect of the meta-physical framework, which most scientific oriented system science and cybernetics avoids in the tradition of avoiding explicit metaphysics beyond science.¹⁶ But the price is, in my opinion, that they lack a theory of meaning, person/subject and first person experience, and qualia.

It is important to note that Peirce does not talk of religion as faith or as a sociological phenomenon and institution: "Religion per se seems to me a barbaric superstition" he wrote in a letter to William James (Brent 1998:261), which also reveals that he has thought critically about both Christianity as well as Buddhism.

In the same year in one of his famous Monist articles *The Law of Mind*. Peirce writes some important remarks to explain the inspiration and new conception of this classical transcendentalism and mysticism:

I have begun by showing that tychism must give birth to an evolutionary cosmology, in which all the regularities of nature and mind are regarded as products of growth, and

¹⁶ Brent (1998:209) mentions how Peirce had had a mystical experience on April 24, 1892, in St. Thomas Episcopal Church in New York. Brent found this letter after having written the first edition of the biography, and it made him change the interpretations in the second version considerably.

to a Schelling-fashioned idealism which holds matter to be mere specialized and partially deadened mind I was born and reared in the neighborhood of Concord, – I mean in Cambridge, – at the time when Emerson, Hedge, and their friends were disseminating the ideas they had caught from Schelling, and Schelling from Plotinus, from Boehm(e), or from God knows what minds stricken with the monstrous mysticism of the East. But the atmosphere of Cambridge held many an antiseptic against Concord transcendentalism; and I am not conscious of having contracted any of that virus. Nevertheless, it is probable that some cultured Bacilli, some benignant form of the disease was implanted in my soul, unawares, and that now, after long incubation, it comes to the surface, modified by mathematical conceptions and by training in physical investigations.

(Peirce, 1994: 6.102–6.163)

Thus his vision has a different conceptualization. The essence of consciousness to Peirce is feeling and an important aspect of Firstness is pure feeling. From a Peircian framework, with its synechism, you have to admit that the universe is permeated with Firstness, but that is not the same thing as human awareness (though it is the origin of it). Peirce writes.

What the psychologists study is mind, not consciousness exclusively consciousness is a very simple thing not ... Self-consciousness ... consciousness is nothing but Feeling, in general, – not feeling in the German sense, but more generally, the immediate element of experience generalized to its utmost. Mind, on the contrary is a very difficult thing to analyze. I am not speaking of Soul, the metaphysical substratum of Mind (if it has any), but of Mind phenomenally understood. To get such a conception of Mind, or mental phenomena, as the science of Dynamics affords of Matter, or material events, is a business which can only be accomplished by resolute scientific investigation.

(Peirce, 1994: 7.365)

Peirce is not speaking of human self-consciousness but of the essence of consciousness as a phenomenon that develops in nature to emerge in new and more structured forms in living beings, nervous systems, and language-based culture. Peirce developed his special understanding of the relation between science and religion as mutually dependent and in mutual fruitful evolutionary interaction, what Raposa calls his “scientific Theism”. He writes:

He clung to “the essence of religion”, to its “deep mystery”, but not to any particular expression or articulation of it. While also adhering “so far as possible to the church.” At the same time, his perspective was informed by and adapted to his ideals as a scientist. Thus he sought to develop and to advocate for persons of faith a distinctive vision and set of attitudes, rooted in his double optimism that “God’s truth” is one and that it is indeed accessible to a community of open and inquiring minds.

Raposa (1989:7–13)

This is the unique position of Peirce. In his writing can be found traces of Schelling, Hegel, but the evolution of the spirit is formulated much closer to the scientific view of his time, which is no wonder as he was so well trained and versed in that. Abduction, deduction and induction in triadic semiotic reasoning were substituted for Hegel’s (and later Marx, Engels and Lenin’s) dialectical thinking process. As in dialectical materialism, Peirce’s concept of matter includes but goes beyond the scientific definition at the time. His way of combining matter and mind places him

in position either between or – I would prefer to see it – beyond Hegel and Marx.¹⁷ Peirce explains this “religion of science” in the following quote:

Such a state of mind may properly called a religion of science . . . it is a religion, so true to itself, that it becomes animated by the scientific spirit, confident that all the conquests of science will be triumphs of its own, and accepting all the results of science as scientific men themselves accepts them, as steps toward the truth, which may for a time appear to be in conflict with other truths, but which in such cases merely await adjustments which time is sure to effect.

(CP 6.433)

We know that truth for Peirce is what the unlimited community of inquiries will discover to be the case in the long run. A good idea is one that will eventually get itself thought and then keep living and thereby exerting a gentle influence in exchange with others interested in exploring the same kinds of insight (Raposa 1989:154).

Thus for Peirce true science and true religion – if being consistent with their own claim of devoted search for and surrendering to truth and meaning – must work side by side exchanging arguments and developing each other towards that singularity in which truth and meaning through the universe’s dialogue and argument with itself converge and meet in a single point. Peirce writes:

The Universe as an argument is necessary a great work of art, a great poem – for every fine argument is a poem and a symphony – just as every true poem is a sound argument. But let us compare it rather with a painting – with an impressionistic seashore piece – then every Quality in a Premiss is one of the elementary colored particles of the Painting; them are all meant to go together to make up the intended Quality that belongs tot the whole as whole. The total effect is beyond our ken: but we can appreciate in some measure the resultant Quality of parts of the whole.

(Peirce, 1994: 5.119)

To sum up then, the relation between science and Christianity in the West has been somewhat hostile. But so has the relation between the Church and the mystics ever since Meister Eckhart was excommunicated after his death in the medieval times. Peirce’s philosophy can be interpreted as an integration of mysticism and science. In Peirce’s philosophy mind is feeling on the inside, and on the outside spontaneity, chance, and chaos, with a tendency to take habits. This is the law of mind; with love as Agape being the sole reason for his three types of evolution. Peirce sees the processes and habits of the universe as thoughts and writes that mind manifests best in protoplasm and the nervous system. In some of Peirce’s manuscripts he further writes of an emptiness beyond the three worlds of reality (his Categories), which is the source from where the categories spring.

Through this foundation for semiosis, a theory of meaning and interpretation including mind as immanent inside nature, it is possible that the proto-semiotic cybernetic views of information can be combined with pragmatic theories of

¹⁷If Marx and Hegel’s philosophies are viewed as thesis and anti-thesis, then his (Peirce) theory is the synthesis, ‘Aufhebung,’ of the opposites to be integrated at a new level. The same view can be argued with regard to Plato and Aristotle’s philosophies of nature, God and knowledge. Peirce is a mystic evolutionary idealist like Plato (without reincarnation theory), but also a realist and believer in empirical research like Aristotle, but he enlarges their concept of logic with his semiotics plus abductive knowledge process and adds an evolutionary theory of both mind and matter.

language in the biosemiotic perspective. Combining this with a systems theory of emergence, self-organization, and closure/autopoiesis, it can become an explicit theory of how the inner world of organism is constituted in evolution and therefore how first person views and the establishment of interpretants is possible. A triadic aspect-monism with a relational semiotic coding, driven by the law of mind and evolutionary love is the dynamics of the semiotic web underling all reality ultimately arising from the non-conscious transcendental infinite speaker to which science can only have access through intuition and Peircean musing. His main route to intuitive insights seems to have been his method of free musing. His road to enlightenment is based on musement or free association combined with abduction, deduction and induction in the collective ethical process of science in the search for truth.

Peirce was a mystic whose road to enlightenment was pragmatism, science and the development of semiotic rationality in society. This radical new view of nature, mind and meaning is what is behind Peircean biosemiotics, which I have developed further into a Cybersemiotics.

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