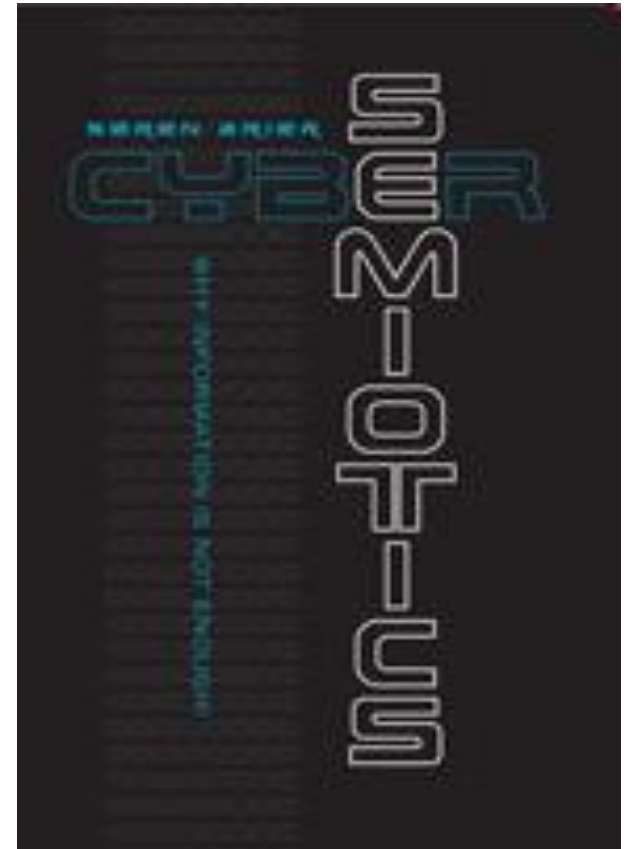


CAN COGNITIVE SEMIOTICS BE A “SCIENCE” IF
ITS PURPOSE IS TO BE A BRIDGE BETWEEN THE
NATURAL, SOCIAL AND HUMAN SCIENCES?
IS THERE A TRANSDISCIPLINARY ALTERNATIVE?

Søren Brier

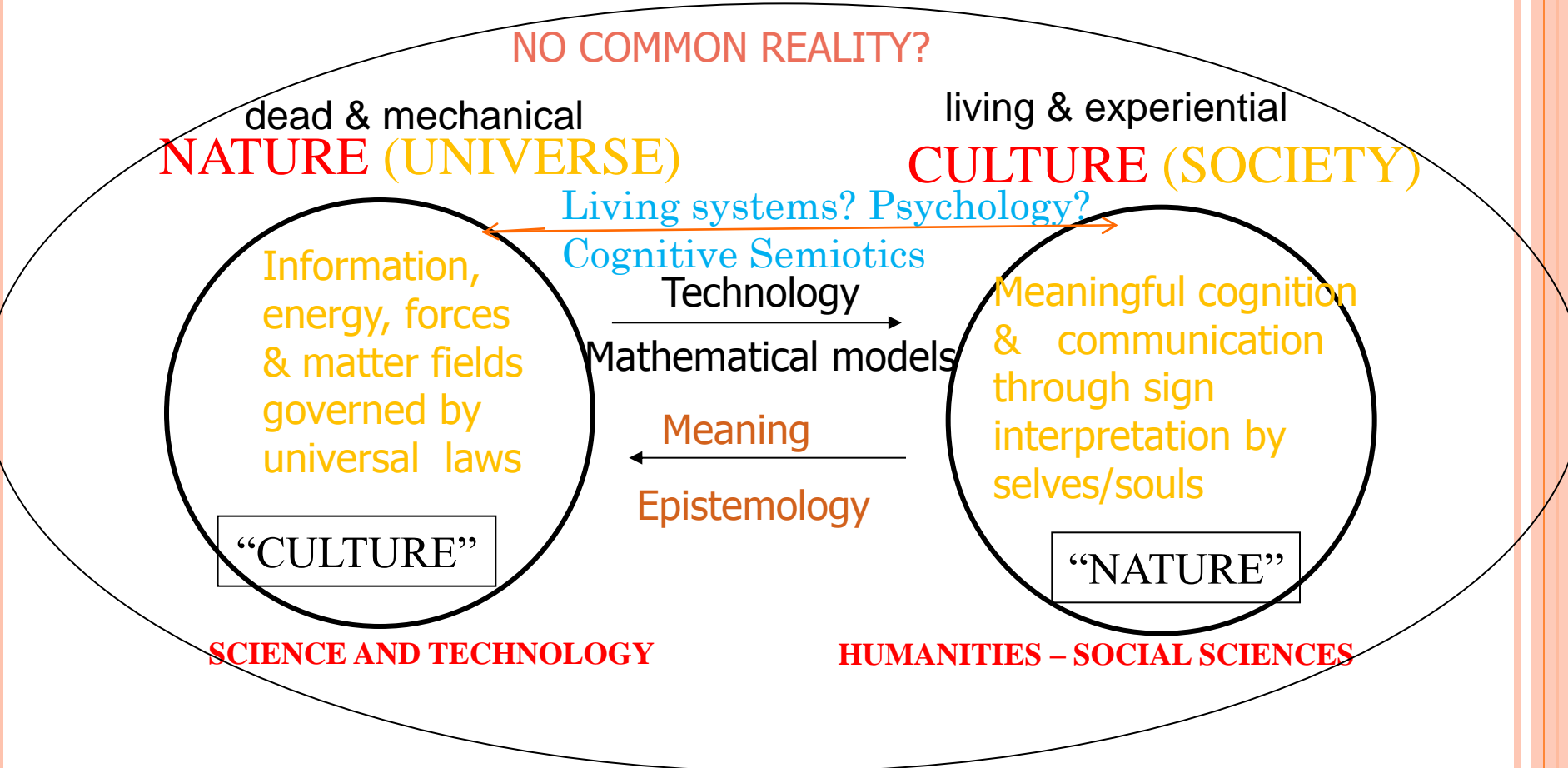


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Cybersemiotics: Why Information is not Enough,

Toronto University Press 2008, 2010, 2013. Google
book and Kindle. Cybersemiotics.com, Facebook and
YouTube

THE TWO CULTURE'S BASIC PROBLEM OF TRANSDISCIPLINARITY



The worldview of Snow's two cultures. Raymond Tallis *Newton's leap*



Is it possible to create a transdisciplinary framework encompassing both?

HEINRICH HERTZ FORMULATION OF THE PROBLEM

“Outside our consciousness there lies the cold and alien world of actual things.

Between the two stretches the narrow borderland of the senses.

No communication between the two worlds is possible excepting across the narrow strip.

For a proper understanding of ourselves and of the world, it is of the highest importance that this borderland should be thoroughly explored.

“ Keynote Address, a tribute to Helmholtz, at the Imperial Palace, Berlin, 1891.—Cited in Davis Baird, R.I.G. Hughes and Alfred Nordmann, *Heinrich Hertz: Classical Physicist, Modern Philosopher* (1998:157.)

ANY INNER CONNECTION BETWEEN TWO CULTURES?

The deep epistemological question is also:
how can living as well as living conscious linguistic beings come to know anything true - or at least true enough to be useful - about the material world (Das Ding an Sich) when there is **no inner connection**?

We only see Das Ding für uns says Kant. We cannot reach the inside of objects with our consciousness! We only have outside connections.

Does it mean that all knowing is objective information exchange between computational systems?

Where does experience, emotion and meaning fit in?
Are they not part of reality for all living systems?

HOW CAN SCIENTIFIC EXPLANATION OF INFORMATION GET INSIDE LIFE AND CONSCIOUSNESS?

1. Since there is no stream of 'information' from the environment going directly into the cognitive system of the organism, that is picked up and gives a more or less 'objective' picture of the "real environment". **All cognition demands relational dynamic interpretation.**
2. One cannot get a theory of signification from a mechanical or informational understanding of the nervous system, nor from a cybernetic computational one.
3. It seems that "the inside" of living systems reality is sensing, feeling, wanting and understanding.
4. But science only deals with "the outside". Science is not about our phenomenological and hermeneutical aspects. They are not part of causal reality.
5. Is it possible to combine a phenomenologically based semiotics with a non-informational systems and cybernetic view to a transdisciplinary philosophical of cognition and communication?



THE PROBLEM OF EXPERIENTIAL COGNITION

Mechanicism does not provide a theory of evolution and irreversibility (Newton, Laplace).

Thermodynamic complexity science does, but it does not have a theory of cognition of living systems (Prigogine, Jantz).

Pan-informational and cognitive science do not have a theory of living systems intentionality and the social construction of meaning (J. A. Wheeler's "it from bit").

Luhmann's autopoietic cybernetic system theory - integrating information in messages - does not give us a theory of intentionality and experiential qualia and free will.

The 4 E theory of mind: Embodied, Embedded, Enacted, Extended is a great step towards closing the dualist gap. But it has not solved the dualism between the received view of scientific Cosmogony and the phenomenology of experiential intentional mind. It is usually make an embodied interactive enactedness that ignores the dualistic problem by pretending to have solved it.

WHY AND HOW DO WE KNOW???

This is a mystery we have not explained and it is in the middle of how to argue for the truth of any evolutionary theory that attempts to explain how we became linguistic and cultural cyborgs with an experiential mind.

I see it as the central argument in Thomas Nagel's *Mind and Cosmos: Why the Materialist Neo-Darwinian Conception of Nature is Almost Certainly False* from 2012. It is not about or for religion or intelligent design.

This is thus the paradigmatic framework from which I want to analyze the biosemiotic problem of making a foundation for a general Cognitive Semiotics. The case I have chosen to illustrate the problems is the year-long discussion within biosemioticians between *Peirce-Uexküll Copenhagen-Tartu "school"* and *Marcel Barbieri's*, which made him found his own *code-biology*.

Central to this is *what it means to be 'scientific'* and how to make a 'scientific' explanation of the emergence of mind.

LIFE IS BASED ON SELF-CONSTRUCTED CODES

- To most biosemioticians a sequence of differences such as the base pairs in DNA can be information for coding or a part of a coding system, but is not a code in itself. Ribosomes and enzymes are adaptors that make interacting with DNA and RNS make code products emerge.
- Living systems function based on **self-constructed codes**. Thus machines do not make codes themselves
- The proteins in the living cell are different from proteins created through external spontaneous chemical processes.
- Living systems are not natural kinds in the same way as physical and chemical systems because their protein molecules are self-constructed by molecular machines (the Ribosomes and connected processes). Cell proteins have the sequences of their amino acids determined by the internal code system in the cell between the gene and the ribosome systems.
- **Living system's structure**, organisation and processes are determined by internal codes and they are therefore in a certain way **artificial**, but are they semiotic?

BARBIERI'S OF CODE-BIOLOGY: DEFINITIONS

A code is: a small set of arbitrary rules selected from a potentially unlimited number in order to ensure a specific correspondence between two independent worlds. Organic codes are relationships between two worlds of organic molecules and are necessarily implemented by other molecules, called **adaptors**, that build a bridge between them. (Not natural laws).

The **adaptors** are required because there is no necessary link between the two worlds, and a fixed set of adaptors is required in order to guarantee the specificity of the correspondence. Ex: enzymes, ribosomes, DNA, RNA.

The **adaptors, in short, are essential** in all organic codes. They are the molecular fingerprints of the codes, and their presence in a biological process is a sure sign that that process is based on a code.

An example of **biological codes** are the codes for the reception and effects of hormones and neurotransmitters various tissues, which is an obvious biological sign system evolutionary build.

Abductive interpretive feeling-based abilities Barbieri views as an emergent quality **created by new neural codes producing emotions** (Barbieri 2011).

Barbieri, M. (2003). *The organic codes. An introduction to semantic biology*. Cambridge: Cambridge University Press. Quotes from: Barbieri, M. (2014): "Introduction to codebiology" in *Biosemiotics* (2014) 7:167–179

FEELINGS EMERGE AS NEW BRAIN CODES

“The idea of a deep parallel between life and mind leads in this way to a parallel between proteins and feelings, and in particular to a parallel between the processes that generate them.

We already know that the assembly of proteins does not take place spontaneously because no spontaneous process can produce an unlimited number of identical sequences of amino acids.

The Code model of mind is the idea that the same is true in the case of feelings, i.e., that feelings are not the spontaneous result of lower level brain processes. They can be generated only by a neural apparatus that assembles them from components according to the rules of a code.

According to the Code model, in short, feelings are brain-artifacts that are manufactured by a codemaker according to the rules of the neural code. In the case of feelings, the codemaker is the intermediate brain of an animal, the system that receives information from the sense organs and delivers orders to the motor organs...” (Barbieri (2011: 380))

WHAT DOES IT MEAN TO BE SCIENTIFIC?

For Barbieri “scientific knowledge is obtained by building machine-like models of what we observe in nature”. On the basis of empirical and experimental data of course.

“Mechanism, in short, is virtually equivalent to the scientific method.”

(From Biosemiotics to Code Biology in *Biol Theory* DOI 10.1007/s13752-013-0155-6)

The consequences of this statement seems to be that **the ideal type of scientific knowledge** about living system is to model them as machines. I think Barbieri is right that this is the dominating view in the sciences.

In contrast the explicit goal of a Peircean cognitive semiotics based on biosemiotics is (also) **to model living systems as cognitive and communicative systems working on the basis of meaning and signification** to add the knowledge we about living systems cognition and communication provided by the mechanical models.

This is two different and incommensurable paradigms (Kuhn)

MEANING IN MECHANISTIC BIOLOGY

- Barbieri strategy is to introduce a concept of biological meaning that is separate from the semiotics he is creating as the foundation for his code-biology:
- “Semiotics, therefore, is not just the study of signs; it is **the study of signs and meanings together**”.
- This is an interesting counter move to a Peircean pragmaticist conception of fallibilist pragmaticist view of science based on a metaphysical framework integrating **phenomenology, tychism, synechism, agapism and fallibilism**.
- My diagnostics is that some scientist that are moving into biosemiotics want to conserve a mechanical physical ontology as the basic ontology and then add Peirce’s semiotics on top. But the metaphysical frames are not compatible as semiotics cannot be contained in the mechanical Cosmos not even when it is enlarged with info-computationalism.

A SIGN IS WHAT AN OBJECT PRESUPPOSES!

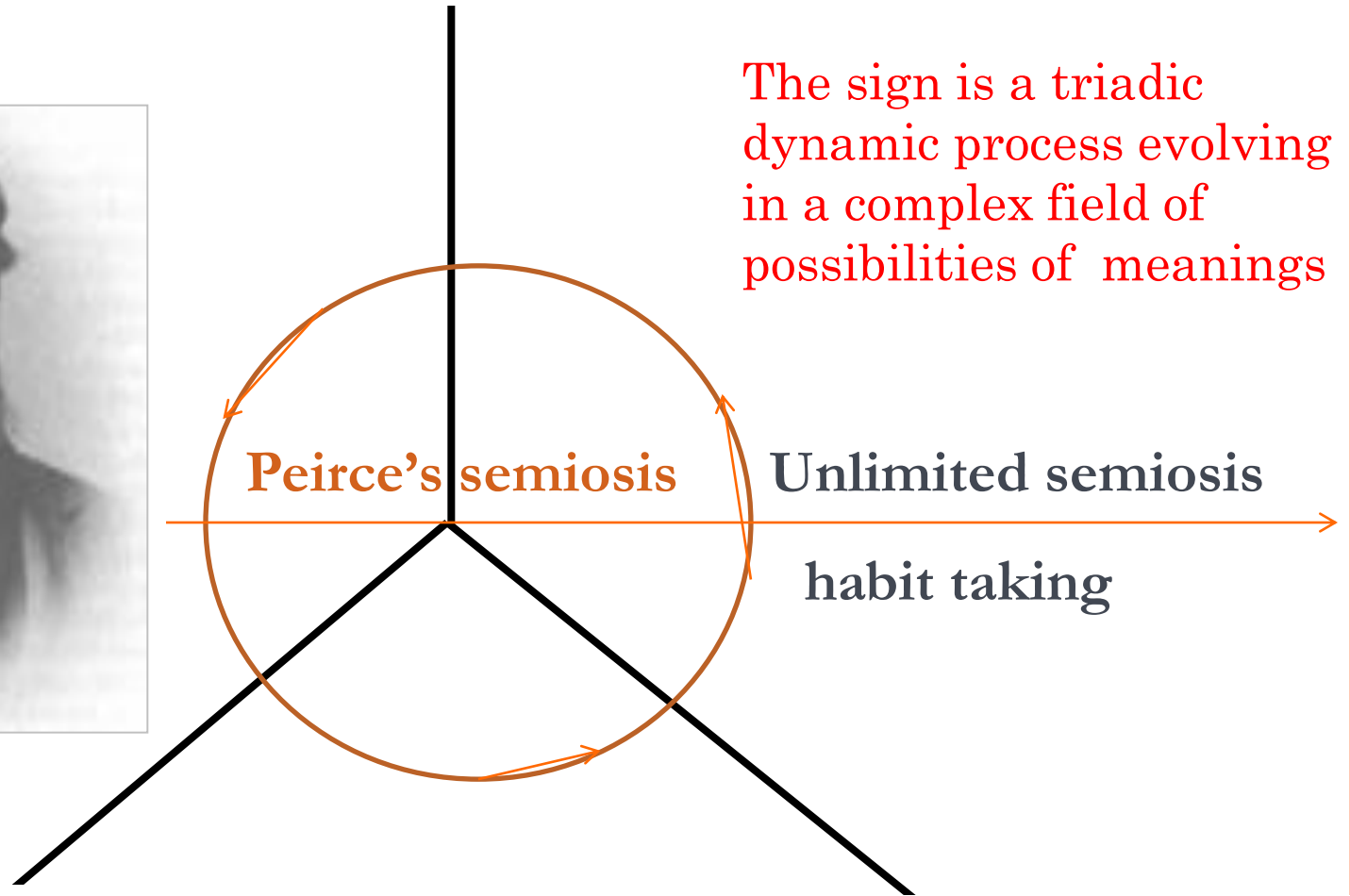
- Peircean semiotics develops a general theory of all possible kinds of meaningful signs, their modes of signification and information, and whole behavior and properties.
- Semiotics is the study of semiosis and is an inquiry into the conditions, which are necessary in order for representations of objects to function as meaningful signs.
- Differences that makes a difference like codes emerges only as part of semiosis. **They are signs! If not they are not seen at all.**
- Semiotics is the theory of the conditions, which determine the truth of signs. Logic presupposes semiotics – logic is semiotic.



1. 'ness: Representamen (the sign vehicle: Possibility)



The sign is a triadic dynamic process evolving in a complex field of possibilities of meanings



2. 'ness Object (a relevant aspect of reality: Haecceity)

3.'ness Interpretant (embodied social practical understanding in the future: would-bes)

CODE-BIOLOGY VERSUS PEIRCEAN BIOSEMIOTICS

- Peircean pragmaticist semiotics differs from
- 1. on one hand the classical physical ontology build out of elementary particles and universal and eternal laws of nature; and on the other hand
- 2. from all forms of ontological constructivism and
- 3. from most other phenomenological and hermeneutical views of humanities and social sciences that does not include a theory of sciences of nature and
- 4. from self-organizing functionalist paradigms, like Luhmann's or Barsalou who claims that "a concept is equivalent to a simulator" or Gabora's suggestion that self-organizing processes in nature "could quite conceivably produce a phase transition the catapults the kind of change in representational strategy that Barsalou rightly claims is necessary."
- Together traditional philosophy of science mechanicism combined with traditional phenomenology and hermeneutics produces a modern paradoxical mutually denying **dualistic world view offering two impossible alternatives**. Constructivism that is inconsistent as a philosophy of science and **mechanicism** that denies experiential meaning and any will-based causality.

TWO LEVELS OF MEANING IN CODE-BIOLOGY

- One problem of Barbieri's suggestion that science's purpose is to produce mechanical models and wanting to encompass interpretation and meaning anyhow.
- The second problem is his introduction of a pre-interpretation biological meaning: **"... meaning is a mental entity when the code is between mental objects, and an organic entity when the code is between organic molecules."**
- This leads Barbieri to suggest **"two distinct types of semiosis in life, one based on coding and one based on interpretation."**
- But as far as I can see organic meaning is not "scientific" as we cannot make mechanical models of it. Or is it Barbieri's claim that we can? When we come to interpretation he simply adds Peirce's semiotic paradigm on his code-biological bio-physical paradigm in the new level of the mental

BIOLOGICAL MEANING . SURVIVAL??

- But Barbieri uses a concept of meaning as part of his code biological paradigm anyway!
- I wonder where he gets it from, because he does not define it anywhere in his writings, though it is tied to his semiotics. He writes:
- “A sign, to start with, is always linked to a meaning. As living beings, we have a built-in drive to make sense of the world, to give meanings to things, and when we give a meaning to something, that something becomes a sign for us. Sign and meaning, in other words, cannot be taken apart because they are the two sides of the same coin.”
- Pretty Peircean !? If it is Darwinian, meaning is only about possibilities for surviving and procreation.

CODE-POIETIC SYSTEMS

Barbieri suggests that “the cell is a code-poietic system” combining anti-informational self-organizing autopoiesis theory with a non-semiotic code-concept.

As I have argued in many articles and in *Cybersemiotics: Why information is not enough* then there is no meaning concept in autopoietic theory’s cybernetic basis. Cybernetics is a functionalistic approach and so is much Neo-Darwinism.

It therefore seems to me that Barbieri’s mechanistic foundation of science, that include cybernetics, contradicts the part that attempts to develop a science of meaning and interpretation. It seems clear from his defining mechanism as the model science method that there are no qualitative sciences.

Consequently phenomenology, hermeneutics, discourse analysis, cognitive embodied linguistics, and pragmatic linguistic and Peircean semiotic explanations are not a part of his concept of science and the integration he searches for is not possible with the code-biological framework as foundation.

THE TRANSDISCIPLINARY PROBLEM OF WISSENSCHAFT

- Barbieri's code biology is therefore unable to produce the evolutionary transdisciplinary bridge between the natural, life, social and human "sciences" or two cultures, which is an immanent goal of the biosemiotic project and cognitive semiotics. Code biology's vision of science is too narrow to become a transdisciplinary framework.
- In my opinion this is why we have to embrace Peirce's pragmaticist semiotics instead. Because the whole goal of Peirce's semiotic pragmaticism was to produce a transdisciplinary framework through his pragmaticist triadic semiotics. Here codes are always part of triadic semiotic process. They are not the foundation for semiosis .

PEIRCEAN BIOSEMIOTICS IN COGNITIVE SEMIOTICS

1. A cognitive semiotics building on biosemiotics, transcends on one hand the pure chemical description of life in molecular biology and on the other hand the traditional idea that semiotics is only the study of signs in the language and culture human beings.
2. Instead cognitive biosemiotics include the whole realm of biology under semiotics. Semiosis is what makes living systems transcend pure physical, chemical and even informational explanations.
3. Cognitive semiotics attempts to integrate the findings of biology and cognitive psychology and linguistics to form a new view of life, logic and meaning as immanent features of the natural world.
4. Peircean semiotics suggests – as **Frederik Stjernfelt** argue in *Natural Propositions* – that there is a sort of semiotic logic in evolution, maybe even in Cosmogony. Living beings seems to adapt to a kind of logical consistency. Could be seen as a kind of Evolutionary Logos.

BIOSEMIOTICS: THE LIFE OF SIGNS IN THE LIVING

1. Signs, in the process of semiosis, are semiotic agents with a certain developmental autonomy of their own, especially symbols. **Symbols grow when added information.**
2. A sign's value can be determined by its contribution to the reproductive and procreative value and well-being of the entire system: Biological experiential meaning.
3. **Semiosis is a crucial part of those processes that make systems living and lift 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.**
4. Behaviour of organisms neither represents internal "self-organization" nor external "information" but interpretations of one through the other in the phenotype as well as the genotype through semiotic logic.
5. Living systems produce their own signification sphere. Though they do not have "language game", they certainly do have "sign games".



CYBERSEMIOTIC FRAMEWORK

- This can framework can be seen as a semiotic interpretation and development of Gregory Bateson's cybernetic definition of *information as a difference that makes a difference* and Niklas Luhmann's triple autopoietic theory of self-organizing social-communication systems integrated into a Peircean semiotic framework.
- Such an integrative transdisciplinary framework is what I have called called **Cybersemiotics**.
- With Peirce I suggest measuring the amount of information as what symbols acquire through their individual and cultural history of use, and the possible effects their accepted truth can generate. Thus I find the requirements of meaningfulness and truthfulness for semantic **information** in need of being enlarged to all living beings and theorized in a semiotic framework, thereby defining why computers and other machines do not communicate. Thus to support true transdisciplinarity we need to define information as an aspect of meaningful cognition and communication suggesting a model like the Cybersemiotic star.

Living Systems

Experiential Consciousness

Not unity-science nor dualism

The Cybersemiotic Star

Kantian wholes and agency (S. Kauffman)

Choice based personal development (Merleau-Ponty)

Non-ergodic or non-equilibrium (Prigogine)

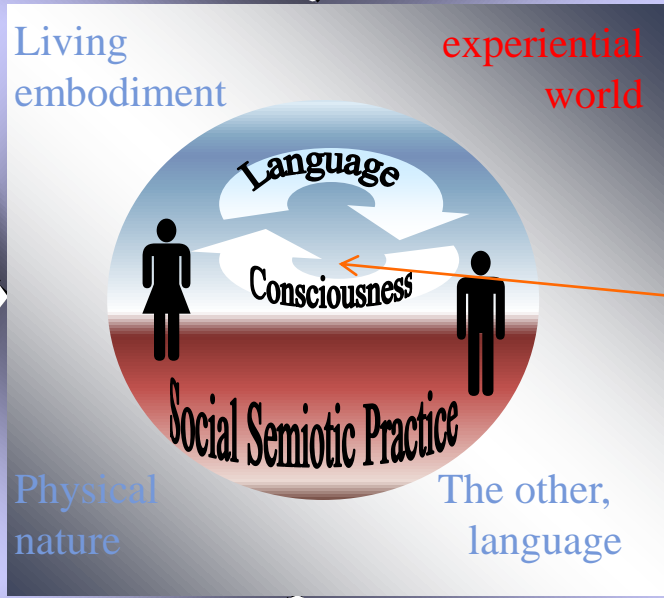
All cognition and communication is embodied semiotic enacted processes. Objects belongs to one of the 4 worlds including the imaginary

Abductive and language-driven knowing (Popper)

Matter/Energy

Social Meaning

The model "breathes" between abductive ideas and empirical falsifications irriversal moving through time. These four "worlds" exist in different timezones



Organic Evolution

Existential Development

Big Bang Cosmology

History of Culture

FROM COSMOS TO INFOS AS PART OF SEMIOS

Reflecting on a transdisciplinary framework that encompasses spontaneity and continuity of mind and matter in an evolutionary theory of irreversible time compatibly encompassing the knowledge of modern natural sciences by enlarging its metaphysical framework.

Thus we have to move from viewing the mechanical **Cosmos** as foundational framework, inserting that into the computational information **Infos** combined with self-organizing system theory and cybernetics into the semiotically framework of Peirce's **Semios** in an inclusive way.

This move us away from mechanicism, as well as info-computationalism and autopoietic system self-organization and into what John Deely calls **physio-semiosis**:

The universe is perfused with signs encompassing natural propositions organized around an evolutionary semiotic logic.

"Logic is the study of the essential nature of signs. ... not of replicas, but of signs" (Peirce EP2.311).

We want to place humans in a universe of signs that integrates mind and matter, inside and outside, transcendence and immanence, law, code, sign and meaning in the hope that it is possible to make a theory of human and cosmic meaning that leads to the possibility of unlimited intellectual and moral growth