

Semiosphere and a dual ecology: Paradoxes of communication

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Abstract. This article compares the methodologies of two types of sciences (according to J. Locke) — semiotics, and physics — and attempts thereby to characterise the semiotic and non-semiotic approaches to the description of ecosystems. The principal difference between the physical and semiotic sciences is that there exists just a single physical reality that is studied by physics via repetitiveness, whereas there are many semiotic realities that are studied as unique individuals. Seventeen complementary definitions of the semiosphere are listed, among them, semiosphere defined as the space of qualitative (incommensurable) diversity. It is stated that, paradoxically, diversity, being a creation of communication, can also be destroyed due to excessive communication.¹

Semiotics is not simple, and cannot be simple, because it must take into account those aspects that natural-scientific approach would either overrule or not notice. But it is a paradox that the method used in order to make the world understandable — the building of models, both in semiotics and in natural sciences — simplifies by itself the state of affairs. If it is indeed so then the attempts to make things understandable may turn out to become a threat to semiotics. However, taking into account that model-building is a general feature of life² — a different

¹ The article is based on the presentation at the *First International Meeting for the Study of the Semiosphere*, organized by Irene Machado and her colleagues in São Paulo, Brazil, August 22–27, 2005.

² “The understanding that biology models the activity of model-building organisms is at the core of biosemiotics” (Hoffmeyer 1999: 156). “This semiotic understanding is also achieved if we include into the features of this model the model-building itself, because models are not the sum of their building blocks but are defined by being about something else; they are complex signs occurring in organisms” (Emmeche *et al.* 2002: 14). The statement that model-building, or Umwelt-building, is a universal feature of all living systems (i.e., an attribute of life), including plants, has been further analysed in Kull 2000.

answer is conceivable. Understanding, from a semiotic point of view, would not be achieved just via a good model, but requires instead a continuous interchange between contradicting models.

In this paper I am going to study the relationship between the semiosphere and the sphere of ecological relationships. That means — in which sense the study field of ecology (an ecosystem, the environmental relationships of organisms and communities) could or could not belong to the semiosphere. In order to find a solution to this problem, we need not only to have a precise definition of the semiosphere, but also to make very clear, what the non-semiotic space would look like, or what is non-semiosphere. Below, I will list 17 complementary definitions of the semiosphere.

1. Code duality, and being in multiple worlds

In several of his lectures, Juri Lotman liked to begin his talk with a paradox. Since *semiosphere* is a very general notion, a description of it via paradoxes might indeed be helpful. A paradox with what it would be appropriate to start here is the famous paradox of learning — Meno's paradox. It has been formulated in the Platonic dialogue *Meno*, and it states that one cannot search for what one does not know and does not need to search for what one already knows. If so, then learning turns out to be impossible. Learning as acquiring knowledge of something else is essentially a sign process, and in this sense it requires an embeddedness into the sphere of signs. Eight hundred years after Plato, in *De Magistro*, in a dialogue between Augustine and his son Adeodatus, Augustine says (e.g., King 1998; Chang 2002): When a sign is given to me, it can teach me nothing if it finds me ignorant of the things of which it is the sign; but if I'm not ignorant, what do I learn through the sign?

Juri Lotman, when describing the assumptions for communication, has described a similar paradox: If two individuals are absolutely different from each other, if they do not have anything in common, then meaningful communication between them is impossible. But if two individuals are absolutely identical, then, also, communication is impossible — actually, it is possible, but they just do not have anything to tell each other.

In its more general aspect, the same paradox sounds as the everlasting controversy between identity and change: in order to continue, one has to remain the same — life itself, however, is *the* changing, life is permanent movement.

The solution to this paradox can already be found in Socrates — in the principle of dialogue. However, Lotman's formulation is more precise. He claims that there is always more than one text, more than one code. There cannot be such thing as single language, or single culture. In order to have a message, at least two different codes, or two languages are required.

A text is a mechanism constituting a system of heterogeneous semiotic spaces, in whose continuum certain initial message is circulated. We do not perceive this message to be the manifestation of a single language: a minimum of *two* languages is required to create it. No text of such kind can be adequately described in a perspective of one single language. (Lotman 1981b: 7)³

To be defined as 'text', a message should be at least dually coded. (Lotman 1981a: 4)

These can be seen as different formulations of the code duality principle.⁴ It presupposes the coexistence of continuity and discreteness in any form of meaning-creating or significant communication. This principle has been similarly described by Jesper Hoffmeyer and Claus Emmeche (1991).

Code duality principle establishes the principal feature of semiosphere — the co-existence of complementary descriptions.⁵ And it is a very non-physical concept (or assumption) indeed — because, despite of N. Bohr's complementarity principle, for physical approach it would be absurd to assume that a single description is by definition meaningless.

The semiosphere can be defined as *the space of meaning-generation*. Indeed, there is only one way to generate meaning — via multiple simultaneous descriptions; i.e., simultaneously to understand and not to understand; or, to recognize and not to recognize one and

³ An English translation in Lotman 1994.

⁴ In analytic philosophy, the problem is often solved via a compositional theory of meaning that every natural language has; or, via a duality or relationship between syntactic and semantic aspect of messages (e.g., Schiffer 1987).

⁵ 'Description' is used here in a very broad sense.

the same thing. J. Lotman (1992: 16) says: “non-understanding [...] appears to be as valuable a mechanism of meaning as understanding”.⁶ Without paradox there is no signification.

Thus, being, or living in all its forms, assumes multiple simultaneous interpretations. And that is what makes learning possible.

2. The semiosphere

I have been interviewing several participants of the conference on semiosphere,⁷ asking them to give a brief definition of semiosphere. As surprising as this may be — the answers turned out to be very diverse. Ten people gave ten different responses. Thus, it may not be uninteresting to list some of these definitions here.

This principle — that neither a sign, an organism, a text, or a culture can exist alone, singly — it always requires another sign, other organisms, texts, cultures, in order to exist, to live — this principle is namely the one that has been formulated by Juri Lotman as the concept of semiosphere (Lotman 2005 [1984]). He formulated this concept first in 1982, under the influence of Vladimir Vernadsky’s concept of biosphere.⁸ Probably the first note on it is in Lotman’s letter to Boris Uspensky from March 19, 1982, in which he wrote:

I am reading Vernadsky and [...] I am stunned by one of his statements. You know [...] my opinion that a text can exist (i.e., it can socially be recognized as a text) only if it is preceded by another text, and that any developed culture should be preceded by another developed culture. And now I find Vernadsky’s thought, deeply founded on the experience of exploring cosmic geology, that life can arise only from living, i.e. that it is preceded by life. [...] Only the antecedence of *semiotic sphere* makes a message a message. Only the existence of mind explains the existence of mind. (Lotman 1997: 629–630)

⁶ “[...] neponimanie [...] predstavlyaetsya stol’ zhe tsennym smyslovym mehanizmom, chto i ponimanie”.

⁷ The First International Meeting for the Study of the Semiosphere, São Paulo, August 22–27, 2005.

⁸ See also Torop 2005; Kull 1999; Kotov 2002; Kotov, Kull 2006.

Thus, here we get the first definition — (1) ‘semiosphere is a textual whole, a text together with other texts that make it a text’.

From here we get also another definition — namely that (2) ‘semiosphere is anything formed from the (endless) web of interpretations’. Or, (3) ‘semiosphere is the sphere of communication’. It “consists in communication” (Hoffmeyer 1997: 933). Thus, (4) ‘semiosphere is a web of sign processes, or semioses’. As it has been pointed out:

The semiotic point of view is the perspective that results from the sustained attempt to live reflectively with and follow out the consequences of one simple realization: the whole of our experience [...] is a network or web of sign relations. (Deely 2005: 16)

And this sort of circle, according to which language, in the presence of those who are learning it, precedes itself, teaches itself, and suggests its own deciphering, is perhaps the marvel which defines language. (Merleau-Ponty 1964: 39)

And not only language, of course, but all varieties of sign systems. (5) “Semiosphere is the set of all interconnected *umwelten*. Any two *umwelten*, when communicating, are a part of the same semiosphere” (Kull 1998: 305).

Few additional definitions can be listed.

Almost identical to (4) is the definition: (6) ‘semiosphere is the space of semioses’. The concept of ‘space’ appears to describe an important aspect of the semiosphere, e.g., (7) ‘semiosphere is the space of meaning-generation’. Also, (8) ‘semiosphere is the space of whole-part relations’. This definition pays attention to the relational dimension of sign, allowing us to state that a sign is always *a part*.

A tradition in semiotics that uses the idea of Gregory Bateson about information as a ‘difference that makes a difference’ could lead to the following formulation: (9) ‘semiosphere is where distinguishing occurs, where distinctions are made’. And as a reformulation of this definition, (10) ‘semiosphere is the space of qualitative diversity’.

Indeed, we may state that ‘diversity in a web’ is the main concern of semiotics. Semiosphere as a space of diversity provides us with the insight into the similarity between various processes of relational diversification, from biological speciation to conceptual categorization.

An existence of identity also assumes a possibility of destroying it. Accordingly, it is possible to think that (11) ‘semiosphere is a sphere of healing’. This is because in a non-semiosphere, there is no such condition as ‘healthy’ or ‘ill’ or even ‘broken’. There cannot be ‘errors’ outside the semiosphere.

Unlike the physical world, which manifests a single truthful reality, (12) ‘semiosphere is the world of multiple truths, of multiple worlds’.

We may also state that (13) “the totality of ‘contrapuntal duets’⁹ forms the sphere of communication — the semiosphere” (Emmeche *et al.* 2002: 21). According to T. Sebeok (2001: 164): “Biosemiotics presupposes the axiomatic identity of the semiosphere with the biosphere”. And (14) “semiosphere is thus the totality of interconnected signs, a sphere that covers the Earth” (Emmeche *et al.* 2002: 21).

3. Semiotics and physics

When speaking about the semiosphere as the space of meaning-generation — or (15) ‘semiosphere as a continuum of culture’ — it would be helpful to compare it to the space that is not (part of the) semiosphere. For instance — atmosphere is obviously not semiosphere. Similarly, anything else about what a semiotician would use an expression “purely physical” would not be semiosphere. Thus it is reasonable to ask what is the difference between physical space and semiotic space (or semiosphere).

It is always necessary to consider that ‘semiotic’ means both an approach and an object. In addition to the semiotic study of semiosis (i.e. semiotics *s. str.*, including semiotics of culture and biosemiotics), there also exists a semiotic study of the environment that is not necessarily a living one or semiotic *per se* (this environment is studied, e.g., by semiotics of environment), which means the textualization of everything, independent of its nature. And, in addition to the non-semiotic study of non-semiotic (or study of “meaninglessness”, as in physics), there also exists a non-semiotic approach to the living, i.e. to semiosis-consisting objects (examples of this approach include large part of biology, and the natural scientific study of society) (Table 1).

⁹ On the notion of ‘contrapuntal duets’ see Uexküll 1982: 54.

Table 1. Interrelation of semiotic/nonsemiotic methods and semiotic/non-semiotic things as generating a principal classification of sciences.

Things \ Methodologies	Non-semiotic (detextualised) approach	Semiotic (textualised) approach
Non-semiotic (not alive)	physics <i>s. str.</i>	semiotics of environment
<i>Primary semiotic threshold</i>		
Semiotic (alive)	biology <i>s. str.</i>	biosemiotics
<i>Secondary semiotic threshold</i>		
Semiotic (lingual)	sociology <i>s. str.</i>	semiotics of culture

This classification follows from the nature of semiosis that multiplies the reality. Consequently, (16) ‘semiosphere is the region of multiple realities’ (or, semiosphere is the world of several realities). However, the region and phenomena of multiple realities can be described as all belonging into one single reality (as the physical approach does). In addition, the regions of single reality can be projected into the multiple one via the description process itself (like semiotics does). Thus, four groups of sciences can be distinguished in this respect (Table 2).

Table 2. Projections of realities from two types of world (of one or several realities) into two types of models (of descriptions in a single or multiple languages) as a basis for classification of sciences.

World \ Models	Non-semiotic models	Semiotic models
Non-semiotic (world of no semiosis)	Single reality into Single reality	Single reality into Multiple realities
Semiotic (world of semioses)	Multiple realities into Single reality	Multiple realities into Multiple realities

According to John Locke, all human knowledge can be divided between three major sciences¹⁰ — ethics, physics, and semiotics.¹¹ Let me try to compare here the last two.

These two principal types of inquiries, or sorts of sciences — *physica et semiotica* — provide two distinct types of descriptions. A brief comparison of these two points of view is presented in Table 3.

Both physics and semiotics have expressed their ambition to study everything in the world, or at least their ability to cover everything. Accordingly, these can be seen as types of sciences, or approaches, or points of view. In principle, any phenomenon can be studied both physically and semiotically.

From Table 3 it appears to be quite clear that the difference between physics and semiotics when studying seemingly one and the same thing is rooted in their methodology. Physics and semiotics are just two different methodologies, or two separate points of view¹² — and two sets of methods — to study the world. A principal difference is that there exists just a single physical world that is studied by physics via repetitiveness, whereas for semiotics there exist many worlds that are studied as unique individuals.

For example, we may study the physics of an organism, and alternatively, we may study the semiotics of an organism. The former is about many things (its mechanics, dynamics, chemistry), but not about meanings. The latter is the study in terms of semiotic space, and accordingly emerging meanings can be studied.

It is important to note that both — physics and semiotics — make predictions. However, the methods of making the predictions are principally different. The physical types of predictions are quantitative — either deterministic, or probabilistic, statistical. The semiotic predictions are qualitative ones. For instance, when studying a text that is currently in the process of writing, it is possible to make a scientific prediction about the next word to appear. In case of a physical approach, a prediction would use correlations between adjacent words in the language, and accordingly it will be possible to calculate the statistical probabilities for the next word. A semiotic approach, instead, would look at the possible meanings of the expression, and provide a prediction about the next word on a purely qualitative basis.

¹⁰ J. Locke has used the expression ‘sorts of sciences’.

¹¹ See Deely 2001: 593ff.

¹² Cf. Deely 2005: 12ff.

Table 3. Relationships between the two types of sciences — physical, and semiotic.

	Physics	Semiotics
Study fields, e.g.	natural sciences	sciences of meaning
	study of quantities	study of qualitative diversity
	physical ecology	semiotic ecology
	biophysics	biosemiotics
Objects (models) of study	physical space	semiotic space, semiosphere
	non-textual or detextualised things and interactions	Textual or textualised signs and semioses ¹³
	laws	codes, habits
	transformations	translations, interpretations
	quantities	qualitative diversity
	<i>multiple</i> objects	<i>unique</i> objects
	world as non-living	living world
Features of objects (models)	commensurability	incommensurability
	context-independence	context-dependence
	no errors in nature	fallibilism
Methods of study	measurements	qualitative methods
	experimental	experiential
	from outside	from inside
	by independent researcher	participatory
	reductionism	holism, mimesis ¹⁴
	statistical tests	comparison
Truth, reality	<i>single</i>	<i>multiple</i>

Speaking about the environment and ecology in this context, one can notice that ecology is clearly twofold. There is an ecology that has been developed as a natural science, according to the Modernist model of science — a field of quantitative research of environment with organic systems in it, without any intrinsic value or meaning in itself.

¹³ Or *objects*, in the sense of Deely 2005.

¹⁴ The role of mimesis as a study method opposed to reductionism has been described by Rosen 1999.

And there is an ecology that includes meaning and value. The latter would include ecophilosophy, biosemiotics, semiotic ecology. The first is a branch of physics, or biophysics, and the latter is a branch of semiotics. Thus, semiosphere is a concept of fundamentally post-modern approach¹⁵ — in the sense of John Deely (2005).

Environment as a physical concept is not the same as semiosphere. But the situation is different if we speak about the ecosphere as a semiotic concept. According to the biosemiotic view, semiosphere coincides with the ecosphere. Hence, this is a concept that can deal with environmental problems without the nature-culture opposition; instead, these problems can be formulated in terms of specific features of sign systems.

Umwelt — a concept introduced by Jakob von Uexküll — is a notion close to semiosphere. We may redefine it: umwelt is a personal semiotic space. Thus — *Umweltforschung*, or umwelt-research is a semiotic study, whereas there can also be, in parallel, a physical study of the environment — of the same environment, however, without any meaning-generation noticed.

Of course — the issue is more complicated, because one can distinguish between physical and semiotic *things*, physical and semiotic *methods or approaches*, and physical and semiotic *models, knowledge*.

If we look at the level of models, of knowledge, and semiosphere being a concept or model belonging to semiotic knowledge, then it is obvious that we can speak about semiosphere everywhere where semiotic knowledge extends. Also, everything physical can be viewed semiotically, can be textualised, and physical models can be seen (interpreted) as special cases of semiotic ones.

If we look at the level of methods, it turns out that physical method is not capable to discover meaning, meaningfulness. In order to detect meaning, we need a semiotic approach — physical approach is insufficient for that (even more, physical approach is unnecessary for that). Thus — semiosphere is a creation or a construct of semiotic method.

If to consider that semiosphere is not just a construct of our theory or method, i.e. that meaning-generation is actually taking place independent of its human descriptions — then semiosphere should exist also in the world of things.

¹⁵ This statement is also supported by M. Lotman 2002.

Semiosphere is formed by those who are capable of making differences. The power of distinction-making is, in a way, also a method. Only those who use at least two codes, two languages, etc., can be a part of the semiotic world, the semiosphere.

4. Diversity

Most briefly, *semiosphere is the space of diversity*.¹⁶ Which means that the semiosphere is heterogeneous space (or communicative medium) enabling qualitative diversity to emerge, to fuse, and to sustain. Diversity is a relational phenomenon, and accordingly, it is based on communication, on the ability to make differences.

Diversity, accordingly, would be a central concept of semiotics. Semiotics can be defined as a study of qualitative diversity — as opposed to physics, the study of quantities.

Diversity means the existence of non-reducible differences, a lack of a common measure that would enable converting one into another. Thus, diversity also assumes certain non-convertibility, or incommensurability.

This leads to a quite paradoxical definition — (17) ‘semiosphere is a communicative space of non-translatibility’. And semiotics being the study of non-translatibility.¹⁷

Let me give one example here. In most organisms, there cannot exist any *interest in survival* — despite of the fact that they appear to behave as if there was something like that. It is because most organisms cannot be informed about their own death — except humans, of course. Organisms have many needs, many animals have emotions, etc., which constitute their interests. There are many interests, qualitatively different interests (in finding food, finding partner, avoiding an enemy, etc.) that an organism can itself distinguish from each other; however, the interest in survival is evidently just applied via models and not recognized by most of organisms themselves. A claim about the existence of a general interest in survival and accordingly a

¹⁶ Cf. definition (10), above.

¹⁷ Cf. Lotman (1992: 15): “translation of non-translatable carries the information of highest value”; Lotman (1992: 42): “Semiotic space occurs for us as a multi-layer overlapping of different texts [...] of various translatability and of spaces of non-translatibility”.

common measure of survival — the quantitative fitness — is a typical example of how physical approach to an issue transforms it and removes qualitative diversity.

In order to communicate, participants not only need to share the semiosphere, but much more — their semiotic spaces have to be similar in several aspects. And there exists a trend of increasing similarity between regular communicants.

It is a paradox that diversity, being a creation of communication, can also be destroyed due to excessive communication. Indeed — communication makes *umwelten* more similar to each other. Or in other words — *too much communication* can be described as a general reason for many ecological problems that lead to homogenization of the world and loss of diversity. This is the case both in biological communities and in cultures:

Communication between cultures makes them more similar to each other, and thus, indeed, too much communication would mean a threat to diversity and identity. On the other hand, cultural differences are not just a result of historical chance and development in separateness. The differences and identities themselves are very much of communicative origin, so the diversity of cultures can be seen as a result of dialogue. (M. Lotman *et al.* 2004: 143)

It is well known how the development of *ecological understanding* of ecological webs and recycling has shifted people's approach and evaluation of many common habits that concern our environment, consumption, trash. In a similar vein, the development of *semiotic understanding* of the semiosphere would lead to shifts that concern many common habits in our cultural behaviour. These may be shifts in the evaluation of diversity and difference, and accordingly, of the communication sphere itself.¹⁸

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Семиосфера и двоякая экология: парадоксы коммуникации

Сравниваются методологии двух основных типов наук (в понимании Джона Локка) — семиотики и физики, — на основе чего характеризуется семиотический и несемиотический подход к описанию экосистем. Главное отличие между физическими и семиотическими науками состоит в том, что для первых существует одна и единственная физическая реальность, которая исследуется с использованием присущей ей повторяемости, в то время как семиотика признает существование многих семиотических реальностей, которые изучаются как единственные (уникальные, индивидуальные). В статье насчитывается 17 разных, но согласующихся между собой определений семиосферы. Согласно одному из них семиосфера является пространством качественного разнообразия (отсутствие единого измерения). Парадоксальным образом коммуникация оказывается как создателем разнообразия, так и — в случае чрезмерной коммуникации — его разрушителем.

Semiosfäär ja kahetine ökoloogia: Kommunikatsiooniparadoksid

Võrreldakse J. Locke'i poolt eristatud kahe põhilise teaduse vormi — semiootika ja füüsika — metodoloogiad, iseloomustades sedakaudu semiootilist ja mittesemiootilist lähenemist ökosüsteemide kirjeldamisele. Peamine erinevus füüsikaliste ja semiootiliste teaduste vahel seisneb selles, et eksisteerib üks ja ainus füüsikaline reaalsus, mida uuritakse temas esinevaid korduvusi kasutades, ning palju semiootilisi reaalsusi, mida uuritakse kui ainulisi (unikaalseid, individuaalseid). Artiklis loetletakse 17 erinevat, kuid omavahel kooskõlas olevat semiosfääri määratlust. Neist ühe järgi on semiosfäär kvalitatiivse mitmekesisuse (ehk ühismõõdutuse) ruum. Paradoksaalselt on kommunikatsioon nii mitmekesisuse loojaks kui ka — ülemäärase kommunikatsiooni korral — selle hävitajaks.