# "Animal Symbolicum" in the Natural and Cultural Semiospheres

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The human as an "animal symbolicum" (by Ernst Cassirer) is a unique being included simultaneously in two semiospheres. One of them is the semiosphere of conventional signs and symbols created by himself in culture. The other semiosphere of natural signals and indexes is available to the human as an animal together with other living beings. Both these semiospheres described correspondingly by Y. Lotman and E. Hoffmeyer, are the subjects of anthroposemiotics and biosemiotics, semiotics of culture, and semiotics of nature. Their interaction is a subject of human ecosemiotics. Both external communicative processes among people and the internal mental activity of individuals contain together natural and cultural semiotic components that interact and counteract with each other. In these processes, the natural signal-indexical codes can be transformed and supplemented by cultural conventions (if, for example, natural expressive movements are subordinated to cultural norms of gesticulation) or modified from pure cognitive means to means of communication—as the codes mediating transmission of perceptual images by depictions. Natural codes can compete with systems of cultural signs on the force of influence on people (as in various fashion systems) or in accordance with them participate in the creation of complex heterogeneous texts (as in arts).

Keywords: semiospheres of culture and of nature, signal-indexical, sign levels of semiosis, codes, and arts

## Semiospheres of Culture and of Nature

## **Semiosphere of Culture**

People live primarily in the world of signs that are created in culture. A set of these signs, sign systems that regulate their use, and the texts that are created on their basis forms a special sphere. Yury Lotman suggested the concept of semiosphere taking as a sample the concept of biosphere described by Vladimir Vernadsky as well as his concept of noosphere. Like, according to Vernadsky (1977, p. 32), a human is "a function of biosphere", he is, by Lotman (1984, pp. 5-6), a function of the semiosphere. The last is defined as a complex "continuum filled by semiotic formations of various types belonging to different levels of organization".

Semiosphere, according to Lotman, contains structurally and functionally diverse semiotic systems. The systems of discrete signs coexist there with continual representations, and verbal languages are used together with various non-verbal sign systems formed in culture. Universal sign systems of language function together with many particular ones derived from them. Not all semiotic systems can be mutually translated, and it is essential for the semiosphere that mutually untranslatable systems complement each other. Therefore, semiosphere is a complex and heterogeneous formation of interacting semiotic systems and the texts formed by their means. All human cultures are immersed in the net of semiotic connections developing in semiosphere.

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It is logical to understand semiosphere as the sphere, in which the processes of semiosis are realized. However, since these processes are not limited to external physical transformations, the boundaries of the semiosphere are difficult to understand only spatially. It cannot be directly associated with the locations of interpreters, bearers of meanings, or denoted objects. Neither interpretation of the constellations as "signs of the Zodiac" nor the attachment of special names to the stars gives any grounds to identify semiosphere with the cosmic space in this nor that way involved in semiotic processes. The concept of the semiosphere does not coincide with the concept of semiotized space, as it is described in Tchertov (1997, pp. 287-288). This concept becomes clearer, if it is associated not with some obscure area of terrestrial or cosmic space, but with the concept of "semiosis", which forms a special logical class.

## **Semiosphere of Nature**

With a broad interpretation of semiosis, this concept can include, on the one hand, sign and symbolic means of cultural origin, and on the other hand, signal and index intermediaries of information processes in wildlife or technical devices. Consequently, the concept of the semiosphere in this case will include all the semiotic means included into noosphere, sociosphere, technosphere, and biosphere.

In this logical, but not spatial sense, it is right to distinguish between the semiosphere of culture and semiosphere of nature. The latter is formed by various information processes intermediated by diverse signal-indexical codes inside organisms and among them. This makes it possible to find not only a formal analogy, but also a meaningful connection between the concepts of "semiosphere" and "biosphere"—since life itself is revealed as a sphere, into which a semiosis, in its broad sense, is truly embedded.

Therefore, Lotman's concept of the semiosphere does not exclude the possibility of its expansion to "biosphere". Such an extension was introduced by Jesper Hoffmeyer, who described biosphere as a semiosphere, where information processes can occur at different biological levels, and semiosis, in the broad sense of the word, takes place (Hoffmeyer, 1996).

Both these concepts of the semiosphere only at first view seem to be opposed, so one can talk about the semiosphere of culture as well as about that of nature. That is essential not only for biosemiotics, but also for anthroposemiotics, because human is included in both of them. Theoretically, it is possible to combine these two concepts of semiospheres on condition that they are in the same time sufficiently distinguished. Such a distinction has semiotic grounds, because the semiotic processes are performed there at different levels.

Biologically, there are various semiotic systems of signal-indexical level. These systems include, first of all, genetic code that develops in the process of biological evolution and is involved in "programming" organisms of different species. In accordance with its norms, in the phylogeny of this species, information that determines the anatomical structure and physiology of each organism is generated and transmitted. Spatial texts regulated by genetic code are constructed from the "alphabet" of four nucleotides at the level of macromolecules. Parts of these texts act as signals guiding the development and functioning of organisms.

At other levels of biological organization—intracellular and intercellular, intra-organism, and inter-organism—other signaling connections develop. Particularly, according to Kalevi Kull (2000), at the level of plants, there is intracellular and intercellular (vegetative) semiosis. It also remains at the level of animals and in this case, they are supplemented with sensor-neuro-muscular systems of semiotic connections.

In addition to these internal systems coordinating structure and functions of biosystems, developed organisms also have regulators of their external behavior in the changing external environment—with the

nervous system and psyche arising on its basis. Nervous and psychic processes are mediated by other signal-indexical codes, many of which are formed in ontogenesis and depend on the specific features of their interaction with the environment.

These organisms not only can react to the signals in a definite way, but also connect them with certain characteristics of the external world. In such cases, the signals are interpreted as the indexes of these characteristics. Such naturally formed indexical codes facilitate the development of an internal "picture of the external world". The psychics of animals and their ability to form some images of their environment are formed on this ground.

According to Jakob von Uexküll's conception, a combination of sounds, colours, smells, and other indexes of the environmental state (*Merkzeichen*) together with a set of impulses to reactions (*Wirkzeichen*) form a special world, *Umwelt*, distinctive for each animal species (Uexküll, 1956). Consequently, animals have the world of biological senses they experience, and it is comparable to the phenomenologically understood "life world" (*Lebenswelt*) of humans. *Umwelt* described by Uexküll fits well into the conception of a semiosphere of nature and can be considered as a part of this semiosphere.

At the same time, natural indexical codes of animals with more or less developed psychics belong to the same level of semiosis that their signal codes. Indeed, the world modeled by these means remains in that environment, where the signals originate from, and the properties of which are marked with indices. Therefore, the whole semiosphere of nature can be described as the sphere, where the signal and indexical semiotic systems function.

It is quite enough for the development of biosemiotics. Nevertheless, the mechanisms of information connection at the genetic level or at the level of neurophysiology suggest that these are not only biological processes that function, but also physical or chemical ones. Between the materially-energetic and information processes, the same relations of the substance of expression and semiotic form are formed, which has long been known to structural linguistics (Hjelmslev, 1961). Just as the physics and physiology of oral speech stay outside phonology that deals not with substance but only with form of expression, so the identification of a semiotic form in information processes of biological systems is separable from the study of their materially-energetic basis. This enables biosemiotics to have the semiosphere of nature as its subject matter.

#### **Information Flows in Culture**

#### Types of Connections between Subjects of Activity

In comparison with nature, other ways of creating and transmitting information develop in culture. On the basis of nervous and mental mechanisms regulating the behavior of organisms in the external environment, a proto-information of non-biological origin is formed—a complex of socially and culturally developed norms and skills that form "non-hereditary memory" of a group (Lotman & Ouspensky, 1992). Such cultural information is generated in joint subject-object and inter-subject actions. In the processes of intersubjective communication, sign level of semiosis is formed as a way to synthesize information flows linking the subject of activity to its object and to other subjects.

Owing to sign means in culture, individual experience can influence that of a group and vice versa—it becomes possible to introduce a person with an experience developed in cultural phylogeny through the means of communication. This refers to the semiotic processes among all the subjects of activity—individual (s) and collective (S). In this respect, information flows of the following types will be distinguished: inside a collective

and between groups (S $\leftrightarrow$ S), between individuals (s $\leftrightarrow$ s), and also group's impact on an individual (S $\rightarrow$ s) and the information influence of an individual on a collective (s $\rightarrow$ S).

In the S $\leftrightarrow$ S type of relations, collective experience is accumulated and translated from generation to generation through the use of verbal language and other semiotic systems. Both forms are thereby used: separate texts and proto-information stored in primary and secondary semiotic systems, i.e., in languages and culturally elaborated codes. Instead of a single text which is, though with mutations, biologically transmitted at the genetic level to all representatives of a species, many texts appear in culture and are regulated by sign systems of different types, from which every individual learns only a part.

Obviously, such information processes are typical for the semiosphere of wildlife, where individuals and groups can also exchange messages coded by natural signal and indexical systems. Individuals of diverse species of animals can give and receive signals between each other. In animals' behavior, one can observe communication between individuals and groups. As Karl von Frisch (1923) demonstrated, a honeybee informs its swarm about the place, where it found a food source, through a "dancing" containing indexes of moving to this source. Conversely, it is known that some animals learn to behavior typical for other animals in their flock through its imitation. However, the principal difference between both these semiospheres is the development in the culture of the systems of signs and symbols that can be arbitrary created and used for representation of objects beyond the environment that is present here and now.

In relations of  $S \rightarrow s$  type, cultural information (i.e., knowledge, values, and technologies) is transferred from a group to an individual through sign systems in educational process, and biological programs of organisms' behavior are correlated to social norms. These include, in particular, prohibition of incest and social regulation of marital relations, food taboos and prescriptions, social regulation of property relations, etc. In this case, functioning of natural codes is limited and coordinated by sign systems of culture, and consciousness dependent on these systems dominates the sphere of the unconscious, into which the results of natural codes action are superseded.

In relations of  $s \rightarrow S$  type, on the contrary, information is transferred from an individual to a collective in products of individual creativity—scientific, technical, artistic, etc. Unlike biosystems, where individual experience of organisms does not directly affect genetic code of a species, sign means enable such a reverse effect of individual experience on the "non-hereditary memory" of culture. Unlike information flows of S $\rightarrow$ s type coming from a group, in flows of s $\rightarrow$ S type, these are mainly not languages, but texts that are transmitted. In other words, in this case, the main subject of communication is not proto-information, but information. This corresponds to the F. de Saussure's distinction between language as a group, impersonal establishment, and speech as an individual production of particular texts. At the same time, it is also possible for individuals to create and spread artificial languages in a collective (Morse code, Braille and Esperanto systems, etc.).

In relations of the s $\leftrightarrow$ s type, sign means enable to include any represented objects available to designation in the communication processes. Signs allow individuals to express their ideas and to reconstruct other individuals' thoughts in the processes of understanding. On this basis, a variety of interpersonal relations, impossible without these sign means, arise.

Human's thought processes develop as a projection deep into the consciousness of external information processes that an individual is involved into, and as a result of their internalization (Vygotsky, 1982; 1983). Unlike the considered above inter-subject information processes, these are intra-subjective ones. However, sign form of semiosis allows them to retain the same syntactic and semantic links as in the processes of inter-subject

communication. In both external communication and internal thought processes, the capabilities of those involved depend on how well they master various semiotic means. Polyglottism, understood in a broad semiotic sense as mastering diverse semiotic systems and ability to relate them to each other, is a quality that characterizes both the ability to communicate and the level of development of intellect.

Thus, the result of information interchange between an individual and a group is revealed; on the one hand, as personal consciousness, where a part of group experience is imprinted, and on the other hand, as culture of collective, in which individual experience of many people is kept. Signs and their meanings become "generalized and socialized" (according to Vygotsky, 1982; 1983), codified in culture units, that are common for collective and individual consciousness. They are the specific means of such reversible communication between these subjects of activity. Due to this reversibility, a person is able not only to receive proto-information that sets the programs of behavior from the outside, but also to change it, transforming the very methods of their activity.

#### Variety of Semiotic Connections in Different Cultures

The balance between the described processes in various cultures is different. In the "cold" (in terms of Claude Levi-Strauss) cultures focused on reproduction of traditions, information links of the S $\leftrightarrow$ S and the S $\rightarrow$ s types dominate. The possibilities of the s $\leftrightarrow$ S relations are limited by the social status of the subject, as the leader's authority is more important, than the arguments expressed by his opponents. In "hot" cultures, focused on innovation, dependence of the individual on the group decreases and the attitude to individual creativity also changes: Value is attached not so much to the reproduction of established ideas as to the suggestion of new ones. In such cultures, information processes of the s $\leftrightarrow$ s and the s $\rightarrow$ S types are more significant and internal processes of thinking become more intense.

Cultures focused on the conservation of traditions encourage reproduction of the habitual thought ways and even the means of their expression (for example, proverbs and sayings in folklore). On the contrary, in "hot cultures", preference is given to productive rather than to reproductive thinking; non-trivial thought processes are valued, which leads to making discoveries, inventing new techniques, creating author's works of art, etc. In such cultures, willingness of a collective to adopt the results of individual creativity becomes a condition for the development of science, technology, art, and more intensive changes in other spheres of culture. Between these poles there is a series of gradations and intermediate forms that historically replace one another, and to which society can return, even if it once reached higher stages of development.

### Human in Semiosphere

#### Human in Natural and Cultural Semiospheres

Defined by Ernst Cassirer (1944) as *animal symbolicum*, human is involved both in the world of symbolic cultural forms and in the sphere of diverse signals and indices available for him biologically. Staying together with other living beings within the semiosphere of nature, men differ from the latter in respect that they also form a special sphere of semiotic means created in culture. Humans are special not because they are closed in this sphere of signs and symbols, but because they are involved both in the semiosphere of culture and in the sphere of natural processes at the signal-index level of semiosis. In this system of relations, human occupies a unique place, because people not only possess genetic information common to the whole species and not only acquire incommunicable individual experience, but also create semiotic means for accumulating group experience and for transferring it to other individuals in acts of inter-subject communication.

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Therefore, the subject of anthroposemiotics is less homogeneous, than that of biosemiotics or semiotics of culture. Whereas the subject of the first of them is natural semiosphere and the second one studies the semiosphere of culture, anthroposemiotics has to consider both these spheres in human activity. Their interaction in human can be highlighted as a special subject matter—the subject of human ecosemiotics.

Cultural semiosphere formed by sign systems cannot be dissolved in natural one, just as human's consciousness cannot be limited to the psyche of the animal. However, this does not mean that the "small" semiosphere of human is in no way connected with the "big" semiosphere of all living things; on the contrary, it is possible to understand it adequately only if we take into account how these spheres interact.

#### Interaction of Natural and Cultural Semiotic Systems

Cultural semiotic forms are largely made up as regulating systems of human behavioral programs built into their biological organization, without reference to which this behavior cannot be fully understood. As it was shown by Sigmund Freud, some natural signal systems are suppressed and their manifestations are either completely forced out by culturally accepted norms or transformed and replaced with symbols accepted in culture. Thus, reactions to human body are awakening by signals of a semiotic system that can be called natural somatic code. This code has developed in the phylogenetic evolution of human as a biological species. However, functioning of this natural code is suppressed or soothed with the help of semiotic means produced in culture: verbal prohibitions and prescriptions, norms of proxemics, haptics and oculesics, etc. regulating meaningful behavior (Kreidlin, 2002).

Law and morality, mythology and religion, art and science, economics and politics, norms of everyday behavior, and the systems of fashion offer their own ways for cultural comprehension of natural behavioral programs. Each of these cultural forms in a special way restricts and transforms the genetically programmed processes and brings them into line with social norms. Collision of natural programs and cultural norms often leads to various sorts of conflicts: between the "first" and "second" signal systems, conscious and unconscious, social and biological, spirit and body, group and individual, etc.

Natural codes in their turn influence cultural semiotic systems. Realization of natural needs takes cultural forms. Particularly, cooking and eating become ritualized and semiotized. Cultural norms also affect marriage processes. Culture creates special semiotic means to express love relations—whether it is courtly poetry in the Middle Ages or love lyrics in later periods. The artists of all times use the shapes of human body created by nature in the cultural forms of sculpture, paintings, etc.

In many cultural institutes, both cultural and natural semiotic systems act together as if competing with each other. In particular, fashion system forms various kinds of relations between signals of natural somatic code and cultural requirements of decency. It creates diverse visual-spatial texts, which are formed by the means of this natural somatic code together with cultural code of clothing accepted in a given time and place.

#### **Artificial Transformations of Natural Codes**

Subjective experience of such a collision by a person, whose psyche it passes through, can be extremely acute and tragic, but can take more harmonious forms as well. Symbolic forms of culture are able not only to counteract signal systems of nature, but also to coordinate with them and, in their turn, to transform them so that they can get involved into semiosphere of culture.

A number of codes developed in biological systems are modified in culture and have their analogs. For example, natural mimicry and pantomime described by Darwin as congenital systems of face and body movements are differently codified in culture. They form an essential part of expressive means in arts.

The art has become one of the most important forms that harmonize the meeting of natural and cultural codes. A number of codes developed in biological systems are modified in arts changing their structure and functions.

For example, indices mediating perception experience and forming psychics for mental processes in an individual at the sensorial level are involved in the complex of pictorial means used in cultural communicative processes. Particularly, diverse natural indexes of depth (i.e., occlusions, intersections, decreasing in size with increasing distance, decreasing of contrast when objects move to the distance, etc.) represent cultural means of linear and aerial perspective and are deliberately used in art. Such means, based on natural indexes, form a culturally developed semiotic system that can be called perceptographic code. Constructed by its means perceptograms can transfer visual images from an artist to a spectator.

There is also a complex of synesthetic codes connecting the sensations of one modality with those of another one. For example, colours can evoke the feelings of cold or heat; angular lines can visually "scratch", etc. These codes largely have their natural basis and can also be deliberately used by artists together with other expressive means (see more detailed on codes of the natural origin in arts: Tchertov, 2005; 2014).

#### On "Semiotic Profile" of a Person

People immersed in the environment of diverse signals, indices, signs, and symbols tend to react to them differently depending on what kind of semiotic systems they are involved into and on how these systems are "balanced". These systems—of both cultural and natural origin—can act together, be neutral to one another or come into conflict with each other.

Composition of the semiotic systems relevant to a particular individual and their relative "weights" in their interactions create a special "semiotic profile" that characterizes this individual as both a biological organism and a social being.

Most of these systems are initially specified by the semiotic environment of a person. Consequently, relations between natural and cultural semiotic systems are more or less determined by culture, in which an individual lives. Some cultures seem closer to nature than others, which generate the notion "indigenous peoples", or *Naturvölker* in German, i.e., peoples that do not know any civilization. Further study showed that these peoples are bound by taboos and other requirements of their culture not less than their researchers are by their cultural norms. Nevertheless, the difference between groups in how much they subordinate natural impulses to cultural norms is an obvious fact, because not all groups strictly adhere to puritanical norms.

The idea of Jean-Jacques Rousseau that the progress of society is connected not with tightening of cultural norms, but with returning "back to nature" probably has its grounds. However, increasing dependence on natural signal systems does not provide a person with more freedom, than strict obeyance to cultural norms does. People get more freedom, when they are involved into diverse semiotic systems and know how to handle them in various situations. In other words, more freedom depends on how rich and varied the semiotic profile of a person is. If an individual can choose semiotic systems and consciously form his or her own semiotic profile, then this only choice determines the result of a "competition" between these semiotic systems regarding their importance in personal activity.

#### Human in Technosphere

The new semiotic systems creating by human, on one hand, increase his freedom. For example, technical

devices, which able to communicate with people and between each other using artificially elaborated semiotic systems, give to human new opportunities. On the other hand, some of these systems themselves can become free and alienated from their creators, if they function in the autonomous mode, for example, as a part of computers software.

Technosphere artificially created by humans is, similar to them, involved in both natural and cultural semiospheres, but acts there in different ways. A machine can be involved in natural physical processes only at the signal-indexical level of the semiosis, where information process is built as a chain of commands and responses. In this situation at the "entrance" and the "exit" of the machine work, only a person can comprehend the data or results obtained at the level of signs and symbols, which bear a certain human meaning and can represent some objects arbitrarily far beyond the present situation.

However, there are no principal barriers that would make it impossible for artificial intellect to rise to the sign level of objects representation and get more involved in cultural semiosphere. For example, if a computer can win at chess champions, that means it can analyse the opportunities given in each position and choose the optimal solutions. Such ability cannot be only a reaction to the signals determined by a signal system, and suggests some arbitrariness that approximates artificial intelligence to the freedom of human thinking. Thereby, if it becomes comparable with the semiotic freedom of a human, artificial intellect can transform from a tool of subject's activity into a separate subject, who can act independently.

In the same time, humans' freedom facilitated by new possibilities given by digital technologies can get limited if individuals become parts of social nets, which have an increasing influence on their behaviour. This trend may lead to the loss of people's independence and their possibilities as subjects of activity. Still this connection remains only moral, not physical.

However, direct interaction of technical and biological programs at the signal-indexical level seems quite possible and theoretically allowable, though not realized yet. Computer programming of genetic and non-genetic memory is generally thinkable. Practical implementation of such a prospect would lead to radical and hardly predictable changes in the whole semiosphere of both culture and nature. If direct connection between information processes of diverse types is made, a person will be physically dependent on the net, and the human can turn out to be just a cell of an integral information organism. After that, connections between information streams of  $S \leftrightarrow s$ ,  $s \leftrightarrow s$ ,  $s \leftrightarrow s$ , and  $S \leftrightarrow S$  types formed in culture can significantly change.

## Conclusion

Thus, the human activity is a field, where the most diverse semiotic means interact between each other. Together with systems of signs and symbols creating by human in semiosphere of culture, there are involved in the same field various signal and indexical codes that have natural origin. Both natural and cultural semiotic systems of diverse levels can not only counteract, but also cooperate forming diverse semiotic complexes. Their diversity is revealed in variety of "semiotic profiles" that have different persons as well as in multiformity of semiotic ensembles that are formed in various areas of the human activity. Particularly, each of diverse kinds of arts—music, architecture, fine arts, etc.—can be considered a particular ensemble of semiotic systems that has its own set of cultural conventions interacting with signals and indexes of some natural codes (synesthetic, architectonic, perceptographic, etc.), even though the last are culturally transformed.

The relations between the semiotic systems of cultural and natural origin are also variable in time opening diverse opportunity at different stages of cultural history. Writing, printing, and then electronic devices provide all

the more different possibilities for communication between individuals and groups and for creating diverse ensembles of semiotic means. Into the old "competition" of the means emerged in natural and cultural semiospheres, the specific semiotic means of a new technosphere started to get involved, and their development can still very radical transform all traditional information flows formed in the human activity.

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