Towards biosemiotics with Yuri Lotman*

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> But it may well be that cognition is, in fact, life itself. That they are not two isomorphic things, but essentially one and the same. (Y. Lotman, in an interview with the author, June 1992)

Semiotics, in the process of delimiting and defining itself, has shown a noticeable trend towards a view which states that semiosis begins where life itself begins. This view is directly supported by a number of recent reviews and books in American semiotics (T. A. Sebeok 1990, 1994) and by several European semioticians (W. Nöth 1994), plus of course by biosemioticians themselves (T. von Uexküll 1987; J. Hoffmeyer 1996; also C. Emmeche, Y. Kawade, K. Kull, A. Sharov, etc.). Indirectly, biology comes closer to semiotics through those who speak about physiosemiosis (Deely 1990), or follow the Peircean 'pansemiotic' approach (Merrell 1996). The same convergence can also be detected in the programs of larger semiotic conferences of recent years.

On closer inspection, some interesting biological elements can be found in the works or approaches of many influential semioticians. Henri F. de Saussure, Ferdinand de Saussure's father, was an entomologist (researching on *Hymenoptera*), which could have had some influence, through the usage of typological and wholistic terms (system, organism), on his son's work (Skuratovskij 1981). Karl Bühler started his research with the physiology of vision and was later interested in zoopsychology (Bühler 1960, 1969; Sebeok 1981). Charles Morris (1946) wrote among other topics about the semiotics of animal behavior. Roman Jakobson (1971, 1988) saw in biology a science of communication. Mikhail Bakhtin (1996) wrote a paper (using the name of the biologist Kanaev) on vitalism. Even Umberto Eco (1988) published an article in which he analyzes the applicability of semiotics in immunology. Although different in their aspects, such articles recur with surprising regularity.

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The naturalness with which Jakob von Uexküll's views have been incorporated into the semiotic kitchen within last two decades seems to indicate the existence of a certain 'sleeping' structure in the basement of semiotics, which is starting to awaken in the search for a comprehensive theory of semiotics, for the origin of sign. For some reason, semiotics, which has centered in linguistics, literature, and arts throughout most of this century (except maybe the beginning of the century, when it stood closer to logic; by the way, according to Lotman (1990c: 4), semiotics as a science did not arise until the middle of the twentieth century), cannot avoid discussing living systems or protect itself from the invasion of biology, or it might be better to say, cannot avoid reciprocal crossings of the border between sign science and life science.

There exists a strong and noteworthy claim made by Amy Mandelker (1994: 385):

> The evolution in semiotic theory during the 1980s might be compared to the shift from Newtonian to relativistic physics. Semiotics of the Moscow-Tartu school evolved from a theory rooted in Saussurean linguistics and in mathematical procedures to a biological, organismic approach. In a series of largely untranslated articles from the 1980s, Yuri Lotman, the leading figure of the Moscow-Tartu school, proposes the model of the semiosphere, a metaphor based on principles of cell biology, organic chemistry, and brain science, to map cultural dynamics.

If this statement proves to be true, i.e., if there was an *organismic turn* in semiotics, centered in Tartu in the 1980s, which may put the relationship of semiotics and biology on a new basis, then it makes a closer view of this situation very important.

A sentence by Vyacheslav Ivanov (whom Y. Lotman regarded very highly), the last paragraph from his 'From the next century' (Ivanov 1994: 490), has been something amazing and unforgettable for our topic:

> I think that Lotman's plan to make all semiotic fields of knowledge into a mathematically exact science, closely connected to natural science (biology) and history, will be achieved next century, to which Lotman belongs with all his testament of thoughts.

Indeed, one of Lotman's positions was that the opposition of exact sciences and humanistic sciences must be eliminated (cf. Eco 1990: x). The discussions in Tartu were interdisciplinary in their nature, but no integral semiotic metalanguage was formulated by Lotman's school (Torop 1992).

In this context, it is interesting to analyze more thoroughly the relation of Yuri Lotman (1922–1993) and the Tartu semiotics of his time to biology.

Thus, I attempt to give here a short review of the lectures and papers by Y. Lotman, which are more directly connected to biosemiotics. It should be noted that in comparison to other topics this subject constitutes quite a small and secondary element in Lotman's work, which means that a more or less complete list might be possible (more general insights to Lotman's work and his school can be found, e.g., in Černov 1997; M. Lotman 1996; Torop 1992; Pyatigorskij 1994; etc.; in recent years, large collections of Lotman's works have been republished, e.g., in a three-volume set in Estonia, and in a six-volume set in Russia).

I should add that there are certainly both direct and indirect relationships with biology in Lotman's writings. My list here includes mostly the direct remarks or influences. Indirect relations — for instance, the similarity of some general problems (or the same methodology, e.g., in theory of classification) in biology and cultural studies — certainly had an importance in some cases, but this is usually very difficult to prove.

Another comment which should be made concerns the possible place of the semiotics of nature (or, more strictly, biological semiotics) in relation to the semiotics of culture. According to the view which has been adopted by many contemporary biosemioticians, these are different branches of semiotics. But there also exists another view, which places the semiotics of nature into the framework of a more general cultural semiotics (I would prefer in this case to apply the term 'ecosemiotics', as different from 'biosemiotics' in the sense of the former approach). In the case of Lotman's semiotics of culture, one can also see a third possibility, although still mainly a potential one — the application of cultural semiotic models for the study of biological systems.

Bio*.*

At first sight, semiotics, as primarily cultural semiotics according to the interpretation of Y. Lotman, has very little in common with biology. Lotman has hardly written anything about the interrelation of biology and semiotics. Also, in the Summer Schools on Secondary Modeling Systems (which took place from 1964 over a period of ten years in Kääriku and Tartu), biologists did not take part, and biology was not discussed. This is true, at least when viewed superficially.

In 1978, the Tartu theoretical biology group, together with similar groups from Moscow and St. Petersburg, organized a conference, 'Biology and linguistics', held in Tartu on February 1–2. One of the key lecturers was Y. Lotman and many of his colleagues participated. Since the end of the

1970s, over about 15 years, Y. Lotman gave several more talks at the meetings held by theoretical biologists in Estonia.

When relating Lotman and life science, Lotman's childhood interest in biology, particularly in insects, should be mentioned. Since his primary school years, he had collected insects, and had wanted to become an entomologist (Lotman 1994: 468):

> In choosing the specialty I hesitated. From the early years I had two inclinations, but my sympathy with biology dominated. I was prepared to become a biologist, and worked at this quite seriously.

Lotman has said, 'The world of insects is in no way more simple than that of mammals, they are not forerunners of vertebrates; this is a distinct world with its closed structure, which we can never comprehend'. But he entered university to study philology, and his occupation with insects was thus finished (Kull and Lotman 1995).

There are several biologists in Estonia whose views he has influenced (e.g., M. Remmel-Valt, A. Turovski). Concerning his son, the biologist Aleksei Lotman, the influences are more complicated — his choice was supported more by his mother, Zara Mints. It was rather because of him that Y. Lotman had to think more about biology than the other way around. 'Logical thinking from mother, creative thinking from father', has been a remark by Aleksei. However, Lotman would have been happy to see his son in biosemiotics.

After defending his doctoral thesis in 1961, Lotman read a great deal of literature in various fields, including mathematics, logic, cybernetics, methodology of biology, etc. This was also the period when he came across semiotics. Lotman's publication list (Kiseleva 1993) shows that his theoretical works, and direct research in semiotics, did not begin to appear until 1962. In 1962, the first Soviet semiotic conference took place in Gorkij (Lotman 1962), followed by a conference in Moscow (in which he did not participate). At that time he became acquainted with A. N. Kolmogorov, a Russian mathematician who had a strong influence on Russian semiotics of that period.

Y. Lotman expressed an interest in animal communication research and encouraged those who conducted it, but probably did not read much of the specialist literature on this subject himself. His knowledge was based mainly on conversations, particularly with his son Aleksei. Y. Lotman's statement, according to which text and textuality are the central notions for semiotics, emphasized the demarcation and differences between culture and biology, at least in the beginning. His interest towards the fundamental questions posed by biology increased much later, when the

meaning of the concept of the semiosphere had crystallized in his mind, and also in connection with the problems of brain lateralization, human self-being and the origins of culture (Lotman 1990b). Quoting Y. Lotman (1990a: 18):

> Semiotics means two things. One is semiotics as a description, as a translation of a behavior into an adequate scientific language. The second — the comprehension of the mechanism itself.
>
> Semiotics can approach biology from two directions — as a descriptive mechanism for various communications of the animal world. We can describe quite well the behavior of higher animals, a semiotician will be interested in it as a form of communication. Far more complicated, I guess, would be the description of insect behavior.

Lotman's remote contacts with Sebeok started in 1966 (Sebeok 1998). Some literature on zoosemiotics, particularly reprints of Sebeok's articles, had circulated in Tartu since that time (cf. Lotman 1997: 492). From this period, the influence of biocybernetic ideas (e.g., N. Wiener, W. R. Ashby) should also be mentioned (M. Lotman 1996).

According to Lotman (1990c: 3), zoosemiotics deals with primary modeling systems (also, language is a primary modeling system — a statement which has been questioned by Sebeok 1994; however, this controversy can be resolved if one considers that the distinction has been made on a relative basis). Since in Tartu semiotics the main emphasis was placed on secondary modeling systems (i.e., the communicative systems of culture), the semiotic problems of biology fell outside its scope. Therefore, biological aspects were treated mainly as 'semiotic primitives', with a few exceptions where cultural semiotics has a bearing on such highly complex biological systems as the asymmetric brain or the whole biosphere. However, biology was sometimes used as a source of analogies for particular questions of literature research; for instance in Lotman (1967: 97):

> Relationship between the artistic idea and the construction of a literary work reminds one of the relationship between life and the biological structure of a cell. In biology, there is no vitalist any more who would investigate life outside the real organization of matter, its carrier. In the science of literature they still exist. Also, a listing of the material 'inventory' of a living tissue cannot unlock the secrets of life: the cell is given as a complex functioning self-accommodating system. Realization of its functions turns out to be life. A literary work is also a complex self-accommodating system (indeed, of an other type). The idea represents the life of a literary work, and this is similarly impossible in a body dissected by an anatomist or outside this body. Mechanicism of the former and idealism of the latter should be replaced by the dialectics of functional analysis.

To my knowledge, there are at least ten different texts by Y. Lotman which have a direct bearing on biology. But before the description of these particularly biosemiotically-orientated texts, let me briefly analyze the origins of some of the more notable trends in the development of the Tartu semiotics group, in relation to our topic here — namely, those connected to the interest in neurosemiotics (hemisphere asymmetry) and the concept of semiosphere.

In March 1981, a joint seminar was organized in Tartu together with a group from Sechenov's Institute of Evolutionary Physiology and Biochemistry in St. Petersburg. A group of scientists (neurophysiologists L. Y. Balonov, V. L. Deglin, etc., and linguist T. V. Chernigovskaya), who worked experimentally on the problems of hemisphere asymmetry of the human brain, visited Tartu, looking for a possible theoretical methodology for the interpreting of their results, which they hoped to find in semiotics. This was followed by a similar seminar in December 1983 (dedicated to the late Balonov; he also had closer connections with Tartu through owning a summer house near the city, in Peedu). The proceedings of these seminars appeared as a series of papers in volumes 16, 17 and 19 of 'Trudy po Znakovym Sistemam'. It is worth mentioning that these problems had already been discussed in Tartu for several years (cf. Ivanov 1979; also, R. Jakobson's interest in this topic was known). Ivanov, particularly, was one who emphasized the role of neurosemiotics for the semiotics of culture. 'The role of biological bases for the semiotics of culture is ever growing' (Ivanov 1987: 4). Lotman saw the relationship between the left and right hemisphere of the human brain in a more general framework of relationships between discrete and non-discrete codes or semiotic systems, of language and space, of spatial asymmetry arising in communication systems, and of the mirror symmetry rule of meaning-generating systems (Lotman 1981, 1984b). Also, the methodological problem of normal and pathological as correlated to the possibility of research into dynamic or static aspects of a system belonged here.

In the 1960s and 70s a series of works by the Russian geologist and biogeophysicist V. I. Vernadsky (1863–1945) were published or re-published in Moscow. Lotman became seriously interested in them in 1982. In his letter to B. A. Uspenskij from March 19, 1982, Lotman wrote (Lotman 1997: 629–630):

I'm reading Vernadsky with much interest and find in him many ideas of my own. ... I am amazed by one of his statements. Once in our seminar in Moscow I was brave enough to declare my belief that text can exist (i.e. it can socially be recognized as a text) 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 deeply argued idea with great experience of investigations in cosmic geology that life can arise only from the living, i.e. that it is preceded by life. ... Only the antecedence of *semiotic sphere* (emphasis by K. K.) makes a message a message. Only the existence of mind explains the existence of the mind.

This very important principle of self-continuity, or logical eternity of semiosis (the principle which has been known in biology since the seventeenth century as Redi's principle, *omne vivum e vivo*), was probably an obligatory step in formulating the concept of semiosphere, and can also help to understand this notion, since in his article on the semiosphere Lotman (1984b) already directed the emphasis toward the aspect of the sphere, its (self-created) boundaries and symmetry rules.

The concept of semiosphere seems to be naturally connected to both the holism of the approach, and the method of research. According to Pyatigorskij (1994: 326–327):

The *ontologization* of a method inevitably had to lead us to the naturalization of an object — limit of which is represented by Lotman's conception of *semiosphere*.

Now, let me turn to less-well-known texts. The majority of sources mentioned below are not published (or not translated), which means that lecture notes, unpublished abstracts, materials printed in small numbers, notes, and interviews are used. These are briefly described in chronological order.

Source 1

In the autumn of 1977, when the Section of Theoretical Biology of the Estonian Naturalists' Society had been established, one of the first invited speakers was Y. Lotman. He agreed willingly, but confessed that he did not know much about the topic. The talk was titled 'The forms of collective life' and held on December 15, 1977.

At the beginning of that talk, he paid attention to the book by Michel Foucault, *Les mots et les choses* (The Russian translation of which had just appeared in 1977), with the subtitle *Archeology of Humanities*, which contained quite a large number of connections between linguistics and biological taxonomy. Speaking on the notion of reality, he emphasized that reality is not the beginning of our cognition and a given fact, but a result of long-term investigations. He compared the ways of information transfer within an organism with that between individuals — the former taking place with impulses, the latter with signs. Impulses cannot lie, signs can. Together with the origin of culture, shame arises. Progressive evolution leads to an increase in diversity, which also means greater differences

between the sender and receiver. This difference causes a stepwise increase in the requirement for communication. In the discussion part of the lecture there was also talk about J. von Uexküll's views. (It is interesting to note here that already the Third Estonian Spring School on theoretical biology, in May 1977, was dedicated to Jakob von Uexküll.)

Source 2

On February 1 and 2, 1978, a large all-Union conference 'Biology and Linguistics' was held in Tartu. This was probably one of the first meetings in this field on a world scale. Besides the speakers from Moscow and St. Petersburg (M. V. Arapov, V. V. Nalimov, J. A. Schreider, S. V. Meyen, A. Sharov, A. P. Levich, S. Chebanov, etc.) there were contributions by B. M. Gasparov, I. Paperno, M. Remmel, J. Kaplinski and others — linguists, biologists, philosophers. Uku Masing was one of those who came to listen. Y. Lotman gave a talk 'Phenomenon of culture' (a version of which appeared in Lotman 1978). This was devoted to the analysis of cyclic and non-cyclic translation, and the mechanism enabling the creation of new text. As a basis for the production of new text, and as a basis for creation, he saw the translation between languages, in conditions where adequate translation is impossible due to the essential difference between languages. From this he concluded that the thinking being cannot be unilingual — intellectual creation originates from translation between languages of different type. He also compared historical consciousness to the mythic or closed-cyclical one, and related this to the differences between the consciousness of the child and the adult.

It is worth mentioning that in the same year the ninth volume of 'Sign Systems Studies' ('Trudy po Znakovym Sistemam') appeared, which included a paper by Aleksandr Lyubischev (1977), one of the leaders of Russian anti-Darwinian biology. The article was presented for publishing in the Tartu series by the mathematician and semiotician J. A. Schreider (1977) from Moscow, an active participant in discussions on theoretical biology and a follower of Lyubischev, also a close acquaintance of Y. Lotman.

Source 3

Y. Lotman's lecture 'Two approaches to behaviour', was delivered at the Spring School of Theoretical Biology 'Theory of Behaviour' on May 7, 1982, which took place at Puhtu Biological Station, the former house of

Jakob von Uexküll (Lotman 1982). That meeting has remained the largest ethological conference ever organized in Estonia (about 130 participants).

Y. Lotman distinguished between two approaches concerning the question of behavior. The first takes as its starting point the behavior of an individual as the main reality and point of reference, from which scientific modeling of behavioral acts begins. The second view takes as its basis the 'behavioral space' as an integral structure, which is programmed primarily in relation to the hierarchically lower-level program of individuals. According to Y. Lotman,

> this leads us to assume that besides the biosphere and semiosphere, it is reasonable to speak about the sphere of behaviour, which is invariant for all living matter and its forms. This would make it possible to move away from pure empirism and to approach typological methods in behavioural research.

According to him, the reconciliation of the two aspects would be the most fruitful. The major part of the lecture was devoted to the phenomenon of asymmetry in semiosis and to brain lateralization. He also made a more general claim, that in any complex semiotic system, a spatial asymmetry arises.

Source 4

Lotman's paper, 'Culture and the organism' (1984a), was published in a book on theory and models in life science. In it, he tries to formulate the general features, which are common to the organism and to culture, at a certain level of abstraction — memory, the symmetric mechanism of homeostasis and asymmetric mechanisms generating the new information, the explosive growth of information content in certain stages of development, etc. Some of these ideas could already be found in his early semiotic papers (Lotman 1970: 105): 'Culture demonstrates features typical of such organisations, as a living organism and a piece of art'. Also, Lotman (1984a: 216) remarks here:

> Similarly to the living organism, whose normal contact to the insentient nature means the prevenient 'translation' of information into the structural language of biosphere, also the contact of every intellectual being with outward information requires its translation into the sign system.

Source 5

Lotman's paper, 'Natural environment and information', appeared in *Lectures in Theoretical Biology* (1988). In this short but very dense text,

Lotman speaks about the organic unity of sign and body. He distinguishes between two types of animals — first, those whose set of possible movements is small and stereotypic, whose movements are automatically caused by external stimuli, and whose entire scope of environmental situations is generalized to a small typological list; and second, those animals whose repertory of movements is larger and more elaborate, who possess feedback between movement and physiological state, and who are capable of play, which creates 'as if real' activity. In the latter case, the movement system could be viewed as language.

Source 6

An interview from April 14, 1990, published in the bulletin of the Tartu student theoretical biology group 'Vita aeterna' (Lotman 1990a). Y. Lotman gave answers to two questions: (a) Which are the specific characteristics of the Tartu school of semiotics? and (b) What are the connections between semiotics and biology? The following is a longer quotation from this remarkable text (Lotman 1990a: 15–16, 19).

When we are communicating, 'you' and 'I', we are interested, in a way, in maximum translatability. When I think, non-translatability becomes a useful factor. Let us assume — we create two ideal persons. They understand each other perfectly and fully, as we might imagine two identical bowling balls. What are they going to talk about? To talk, I do not need a perfect copy of myself, I need another person. I need a difficulty, since the difficulty means the creation of the new, a new thought. Only an old thought can be translated ideally.

In this, by the way, I see the principal and for me still inexplicable difference between the living beings for which the important moments of life are pre-programmed, and humans whose behavior may include unexpected actions, and for whom those inherently non-preprogrammed types of behavior cover an ever larger part of life and gradually become the main. This is quite amazing, come to think of it.

Semiotics of animals is researching such aspects as, for instance, sexual communication, eating, breeding; these are traditional forms and animals acquire and transmit them. Such behavior is a language similar to our language of folklore. It is repeated as the same, and every time created anew. Humans, however, consider the repeated forms of behavior to be secondary, and promote unexpected behavior. Evidently, man when he appeared resembled a mad animal, and I suppose that was the reason why this relatively weak creature could survive and kill much bigger animals. They were not able to predict his behavior.

In such a way I would speak about the semiotics of mammals, which to me seems real. This is another semiotics, another type of language — but we are not

only humans, we are also mammals, and therefore we also have mastery of that language. It could be suppressed, or more dynamic, or less dynamic.

The appearance of language in our sense of the word was an upheaval, perhaps a tragic one, but a groundbreaking upheaval which created a fundamentally new situation. This is one aspect of the approach of semiotics to animals, which allows us to penetrate into the world of semiotic constants, invariable situations and inheritable behavior. On the whole, I think that *zoosemiotics should become part of linguistics, or linguistics part of zoosemiotics*; let us not argue about the priority, but it seems to me that a zoologist ought to be a linguist, and maybe a linguist ought to be a zoologist.

Source 7

An interview with Y. Lotman by the author, on biosemiotics, in June 1992, was recorded on tape in the hospital in Tartu. From this interview, the motto at the beginning of this text is taken. We talked about J. von Uexküll's notion Umwelt, which Y. Lotman considered very productive. I asked several questions on semiotic biology, concluding with the question, 'What is life from the semiotic point of view?' Lotman answered:

Life, from the point of view of semiotics, I suppose, is the ability for informational self-reconstitution. But the creation of information is, in fact, the conservation of information and its reproduction. It is, so to say, informational revolution. At the same time, the obligatory 'correspondent' is continually changing.

Source 8

Y. Lotman's introductory remarks to the course on biosemiotics are preserved in an unpublished manuscript (1993). Before I first read the 'Biosemiotics' course at Tartu University in 1993, I asked Professor Lotman to introduce this new series of lectures. Because of his illness, it was impossible for him to present his ideas in person. On September 8, 1993, in the hospital, Alexei Lotman transcribed them simultaneously in Estonian. It is probably the last semiotic text by Y. Lotman. He died on October 28, 1993.

In this text, Lotman speaks about the existence of several levels of semiotic systems, and describes the role of gesture language, the connection between the meaning of a sign and deceit, the free relationships which are introduced by a system of signs, and the role of memory and forgetting. He states that biology and semiotics as different sciences have been developed independently, but due to the dynamic processes of objects which create new situations and new mechanisms, a new situation arises which relates

biosemiotics and cultural semiotics, and requires the creation of new adequate languages for their description. The closing sentence of this introduction reads as follows:

> When starting with biosemiotics, you are not entering into a new space, but on an endless path. The sense and specific characteristic of this sphere is motion.

Source 9

The chapter 'Myslyaschij trostnik' ('Thinking reed') in Y. Lotman's book 'Kul'tura i Vzryv' (1992; a translation in Lotman 1996). In that chapter, Lotman analyzes the differences between learning and some other forms of behavior in animals and humans. He took the heading of this chapter ('Thinking reed') from a poem by F. I. Tyutchev. This metaphor originates from B. Pascal: 'Man is a reed, a bit of straw, the feeblest thing in nature. He is a thinking reed' (Pascal's *Pensées*, no. 347).

The dynamism of signification and communication systems, and the opposition of predictability and unpredictability are seen by Lotman to be the general features directly connected to the catastrophes as described in topologic biology (e.g., by R. Thom) or in the thermodynamics of irreversible systems (cf. Pocheptsov 1993).

Source 10

Last but not least, it should be mentioned that Lotman's book *Universe of the Mind* (1990b) includes the analysis of many problems which could have a direct bearing on semiotic biology — semiotic barrier, meaning-generating mechanism, semioticization of body, his interpretation of the notion 'text' itself (as a generator of language), the fundamental multiplicity of languages. He treats the symbol as a special kind of 'textual gene' (Lotman 1990b: 101). Also, it includes an interpretation of I. Prigogine's and I. Stengers's views, whose book *Order from Chaos* appeared in its Russian translation in 1986 (Lotman 1990b: 230–234).

> Lotman draws suggestive analogies between the asymmetry of our cerebral hemispheres and the asymmetrical process by which culture is generated, as if the ultimate endorsement of his cultural schema might be expected to come from biology itself. (Sturrock 1991: 10)

If we think of biological organisms themselves as textual systems (not only to be described as texts), including texts which can be self-reading

and self-translating (Lotman's interpretation of the notion of text can allow this, cf. his 'culture as a text', and Pyatigorskij 1984), then many examples from literary science start to resound and resonate in the vast space of living nature. The boundary, which surrounds a semiotic system as 'self' and distinguishes it from 'non-self', is not, according to Lotman, a mere line or surface, but a whole region with a complex and generative behavior. A semiotic approach can contribute to our understanding of the most fundamental questions of biology, including the origin of species (Kull 1992). But still, there is a long way to go.

Lotman's influence on Tartu semiotics continues. Since 1993, several visiting scientists have lectured on biosemiotics in Tartu (T. von Uexküll, J. Hoffmeyer, S. Chebanov, B. van Heusden, T. A. Sebeok). On November 16, 1993, the Jakob von Uexküll Centre was established in Tartu. In 1994, Thure von Uexküll was elected an honorary doctor of Tartu University in semiotics and psychosomatic medicine. The recent Estonian Spring Schools in Theoretical Biology were entitled 'Theory of Recognition' (1995), and 'Languages of Life' (1996). The first ecosemiotic meeting took place in Tartu and Puhtu in May 1998. Tartu semiotics seems to have good reasons for contributing to biological semiotics and semiotic biology.

Concluding remarks

Lotman's legacy is extensive, and the role of biology in it is marginal and small. However, looking at it more carefully, we find that the biological part, a biologicity in the sense of biological holism, is nevertheless surprisingly important, it exists in considerable amounts (notably from the 1980s) and, although the texts in which he expresses his views on more biological issues were mostly initiated by other people, those who did not belong at that time to the Tartu-Moscow semiotic circle (e.g., the neurophysiologists of St. Petersburg, or biologists of Tartu), they may have been quite necessary for Lotman himself. In any case, he was open toward the biological direction in semiotics.

Y. Lotman did not treat biosemiotics in any great detail, but he formulated several important questions and proposed some new concepts (semiosphere, sphere of behavior, relation between symmetry and asymmetry, dialogue and independence of individuals, the assumptions for the creation of new text, etc.), which are a good basis, and possibly a framework, for further analysis of biosemiotic problems.

In existing biosemiotic literature, Lotman's name still appears very seldom. An exception is the recent application of the concept of semiosphere by Hoffmeyer (1996, 1997a, 1997b).

According to Mandelker (1994: 390, 392):

> The spatialized and biologized concept of the semiosphere enhances the earlier Moscow-Tartu school notion of inner and outer cultural perspectives. ... The sphere also invites the borrowing of some suggestive topics from biophysics and cell biology: enclosure and disclosure, resistence and responsiveness to penetration, and the assimilation of intruding and extruding elements. ... Lotman's sphere of silence embraces, encloses, and embodies the utterance just as the biosphere, in the form of the earth goddess Gaia, embraces all life and lies passively open to men's husbandry.

I cannot say that I agree with Mandelker (1994) in every detail; however, the reason for my not noticing the organicist turn in Tartu may be a result of looking too closely at the issue. Nevertheless, the biologically holistic view, which is particularly remarkable in the later works of Lotman, led him to a theoretical system which may certainly be helpful in the search for a holistic and organicist theory of biology, a quest which is undergoing a noticeable revival at the end of this century. This also seems to have a great potential for the theory of semiotics itself. According to Eco (1990: ix).

> It is not possible to distinguish the rule system appropriate to a given communicative phenomenon without at the same time postulating a structural homology with the rule systems which apply to all other communicative phenomena. The new Russian semioticians developed a universal semiotic theory (and method) whereby the rules governing each communicative sector were to be seen as variations of more general codes.

I do not see much point in more detailed reconstructions of Lotman's biological views. A great deal more important for further progress in biosemiotics can be the application of his method, and the reconstruction of the set of oppositions and principles he saw and used in his general, highly productive, and creative approach for studying semiotic systems, since living systems also belong to them.

Lotman's birthday (February 28) coincides with that of Tartu's greatest biologist — Karl Ernst von Baer, with a difference of 130 years. There are no direct relationships between them, however, there is a coincidence in their holistic views, a similarity in the more general tradition to which their views belong, and of course — the power of their ideas. And the same street where they lived. May be, it is still a fragment of romanticist atmosphere, or *genius loci*, which has been carried by an invisible cultural text in the same living semiosphere.

Note

* An earlier version of this paper is based on a lecture presented at Y. Lotman's memorial conference in November 3, 1995, in Tartu. I thank Peeter Torop, Michail Lotman, Alexei Lotman and Galina Ponomareva for their kind comments and information, and T. Laats for correcting the translation of some quotations from Russian.

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Special Issue

Biosemiotica I

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