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[Aller au sommaire du numéro](#)

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Résumé de l'article

Parmi les notions développées par Lotman, celle de sémiopshère est certainement celle qui a été la plus commentée. Dans cet article, nous explorons ses dimensions écologiques et biologiques, en remontant au concept de biosphère proposé par Vernadsky et à la vision environnementale de l'art qui apparaît chez Lotman dès *La Structure du texte artistique*. Notre enquête expose les aspects biosémiotiques de la pensée lotmanienne, aspects qui permettent l'émergence, en son sein, d'un modèle cyclique, homéostatique de la culture, contrebalançant ainsi une vision moderniste où l'art participe à un progrès naïvement linéaire.

The Semiosphere, Between Informational Modernity and Ecological Postmodernity

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Introduction

Juri Lotman was a nature lover. His elder sister, Lidia, makes this clear when she quotes from his “non-memoirs” : “Entomology has always been an object of love for me, and this feeling persisted even after I had given up the idea of studying insects. Palaeoptera and polyneoptera especially attracted me, and I was on the verge of writing a paper on neoptera, something I now regret not having done” (1995 : 46-7, our translation). Lidia confirms that during highschool, Juri had two main passions : nature and literature (1995 : 48; see also Kull 1999 : 118). She remembers how, in the years preceding his enrolment in the army, shortly after he turned eighteen, Juri spent his summers working in a children camp where he founded a “friends of nature” circle, and participated in the organisation of a small zoological garden, where he could observe animal behaviour. A few years later, on the Second World War’s Eastern Front, Lotman encounters a hare during a violent shelling. As they both flee, he blinks to it in a moment of deep empathy : Lotman feels that they understand *together* how difficult the situation has become. He even suspects the hare of smiling back (1995 : 47).

It is not surprising, then, that one of Juri Lotman’s crucial contributions to the study of cultural and semiotic phenomena would be his early integration of insights from biology, ecology, and information theory into the humanities’ toolbox. During the last decades of the

20th century, while most Western scholars are progressively abandoning the structural paradigm (for its alleged excessive rigidity), Lotman, with an unshaken scientific rigor, continues to expand it, articulating the fundamental questions of our attachment to art and literature from within the broader context of our existence as organisms living in a physical and biological world. This biosemiotic angle appears at specific moments in Lotman's oeuvre, for example when he uses biological images or through the conceptual lineage of some of his key ideas, such as the semiosphere. Indeed, the essay "On the Semiosphere," first published in 1984 in *Sign Systems Studies* and deemed of great importance by Lotman himself (Sebeok 1998 : 30), shows the Russian thinker borrowing from the life sciences in order to reflect upon our practices of meaning-making within a cultural environment. This "environmental turn" seems to coincide with the invitation extended to Lotman by Tartu's theoretical biology group to be a keynote speaker for a conference on biology and linguistics in February 1978 (Kull 1999 : 117), an invitation that marks the beginning of a regular attendance at such events throughout the last decades of his life. But as we have just seen, Lotman's interest in nature and animal life goes back at least to his teenage years, and we can already find an environmental vision of art in his foundational book *The Structure of the Artistic Text* (1971).

This paper aims at refining our understanding of what has become one of his most widely discussed ideas, namely, the semiosphere, by unearthing its roots in this earlier work and by examining how the introduction of biological and ecological thinking, through models and images inspired by metabolic cycles and homeostatic processes, ends up counterbalancing Lotman's tendency to consider art as a mechanism of linear growth and progress. In the twenty-some years separating *The Structure of the Artistic Text* (1971) from *Universe of the Mind* (1990) and *Culture and Explosion* (1992), this tendency, inherited from the avant-garde Russian Formalists, and more generally from Modernism, is tempered by an ecological perspective interested in stabilization and cultivation and not only in growth and expansion. On this specific point, we can consider that Lotman anticipated contemporary ecocriticism and environmental humanities.

This essay begins by briefly retracing the intellectual genealogy of the semiosphere, mapping its source in geological and biological theories. This notional history will delineate the terrain from which we will study particular aspects of the semiosphere such as its asymmetrical structure with its center and periphery, a structure obeying the rhythmical cycle of ingestion (causing growth) and self-description through auto-communication (leading to stabilization). Expounded in *Universe of the Mind*, this complex dynamic will be made clearer by linking it with Lotman's earlier theorizations on code and the languages of art in *The Structure of the Artistic Text*, theorizations that reveal Lotman's sensibility for the life sciences and for information theory. By creating these links,

going back and forth between these major monographs, we hope to complete earlier epistemological readings of Lotman's work (such as Kull's enlightening investigation of its biosemiotic aspects, 1999) and to assess the usefulness of the bridges it builds between aesthetic, cultural and biological activity.

Lotman, the Natural World and Its Many Spheres

It has been a common strategy for its detractors to suggest that structuralism (and post-structuralism) is adverse to biological considerations (see for example Richard Shusterman's critique of textualism 1997 : 173, or Floyd Merrell 2003 : 213), and more generally to the integration of natural and cultural phenomena. A forerunner of structuralism and the father of *sémiologie*, Ferdinand de Saussure, established in his posthumously published *Cours de linguistique générale* that the fourth and final moment in the history of linguistics happened at the turn of the 20th century with a convergence of ideas, one of these being the realization that language was essentially a conventional (non-natural) institution : "we do not see in language (*langue*) an organism that develops on its own, but a product of the collective mind of linguistic groups" (1916 : 19). Language does not have the same characteristics as natural organisms and thus cannot be explained in reference to them. Rather language is a pure social product – and we are to understand that the adjective "social" here refers to something qualitatively, essentially different from what is referred to by "natural."

The primary source of Saussure's understanding of language is neither ecology nor biology, but rather a blend of comparative linguistics and sociology (as these disciplines stood in the early years of the 20th century). Nonetheless Saussure is compelled to admit that language is at least partially determined by biology, as we can see in his frequent references to bodily mechanisms (for example, in his sections devoted to the operations of the vocal tract and the processes of articulation, pp. 66-76). In addition, his notion that the collective mind actually produces language (*langue*) implies a form of systemic intelligence situated outside the individual; had Saussure been given the chance to pursue his investigations, we can wonder if he wouldn't have realized that "outside the individual" encompasses among other things an immense variety of biological phenomena. This is not the place to attempt a generous interpretation, nor a revisionist account of Saussurean linguistics. Suffice it to say that from the very outset, structuralism could be seen as already struggling against itself, and with the fact that the body had to be reckoned with.

As a semiotician specialized in the history and dynamics of culture and as a late incarnation of structuralism, Lotman might have inherited Saussure's tendency to neglect biological reasons in his explanations of language and meaning. A superficial reading of his work

might erroneously confirm this suspicion. It is true that, even if some of Lotman's ideas have been convincingly integrated into biosemiotics or other bio/nature-oriented disciplines, his direct contributions to the life sciences appear slight. But a close reading of his work will trace its biological and ecological roots. In fact, Lotman appears to us as a clear example of a structuralist going beyond disembodied formalism in his inclination towards biological and ecological phenomena.

Lotman's interest for the life sciences appears early in the preface of *Universe of the Mind* when he declares that nature and culture are connected. He writes : "The discovery of mechanisms in the individual thinking apparatus [*i.e.* the brain] which are functionally isomorphous to the semiotic mechanism of culture has opened up a wide field for future scientific study" (3). Lotman saw that nervous systems, like cultures, are control systems regulating the activities and maintaining the complex organization of a society (of persons, of cells, see Damasio 2010 : 38). He saw that such regulation comes about in both cases through semiotic activity (the exchange of information through specific codes, from alphabetical writing to the electrochemical signaling of neurons). Lotman deplores that "the question of the overlap between the semiotics of the humanities and neurophysiology has surprised some people" (3). The relationship between nature and culture is so obvious according to Lotman, that, following Roman Jakobson, he calls those who still refuse to see it "proponents of 'brainless linguistics'" (3). The qualification here borders on the reprimand. It is important to note that Lotman is stating two things. First, natural and cultural processes are *analogous* in that they display similar arrangements and movements. (These analogies allow the establishment of continuous relationships between, for example, our understanding of : eyes, optic nerves and brains; the function of icons; and, ultimately, the history of painting and visual arts.) Second, natural and cultural processes actually *influence* each other. (For example, work-related obligations can generate insomnia or digestive disorders, and regular physical activity can help us concentrate and accomplish work-related tasks.) So even if *Universe of the Mind* is a key text in cultural history, we are told, right from the beginning by Lotman himself, that its course can only be plotted if we take into account the organisation of the natural world, here appearing in its neurophysiological aspect.

Another telling case of Lotman's keen awareness of the natural world is revealed in his terminology. The term *semiosphere* is not just the fruit of Lotman's fanciful thinking, but a cognate of expressions used in the life and earth sciences. The *lithosphere* names the solid shell of rocky planets (consisting of, in the case of Earth, the crust and the upper mantle); the *atmosphere* names the envelope of gases of those planets; the *hydrosphere* is used to designate the combined mass of water found in the ground, on the surface, and in the air. One of Lotman's key references, however, is the *biosphere*, a term coined by the Austrian geologist Eduard Suess. In his three-volume *Das Antlitz der Erde* (*The Face of the Earth*, 1885-

1904) Suess outlines the most recent theories concerning geological morphology. Following the idea that the Earth consists of concentric and sometimes overlapping spheres, Suess writes :

One thing seems to be foreign on this large celestial body consisting of spheres, namely, organic life. But this life is limited to a determined zone at the surface of the lithosphere. The plant, whose deep roots plunge into the soil to feed, and which at the same time rises into the air to breathe, is a good illustration of organic life in the region of interaction between the upper sphere [atmosphere] and the lithosphere, and on the surface of the continents it is possible to single out an independent biosphere. (quoted in Smil 2002 : 1)

Suess was a geologist who wrote more than a century ago. This could explain why he excluded from his definition the abundance of oceanic life forms and those that thrive in the atmosphere. Nevertheless, Suess had cast a new idea in the encyclopædia of human knowledge, an idea that effectively bridged the life and earth sciences. Yet Suess would not elaborate on the biosphere, and it was to remain relatively ignored until its reintroduction by Vladimir Vernadsky, the Russian mineralogist and geochemist. The influence of Vernadsky's work will be extensive, ranging from Teilhard de Chardin's noosphere to Bakhtin's logosphere, the dialogic sphere formed by the multitude of utterances (Mendelker 1994 : 386-387). If, according to Mendelker, Bakhtin's logosphere might have inspired Lotman's thought on cultural systems, he refers directly, in his own writings, to Vernadsky : "we justify our term [semiosphere] by analogy with the biosphere, as Vernadsky defined it, namely the totality and the organic whole of living matter and also the condition for the continuation of life" (1990 : 125).

Not only was Vernadsky a distinguished scientist, but he was also attuned to cosmic and mystical theories. As many scientists and philosophers of the late Modern era, Vernadsky was also a progressivist in that he championed the idea that developments in science, technology, economics, and social organisation defined humanity's upward, linear evolution. The biosphere was a stepping-stone in human evolution, a process which Vernadsky described as closely intertwined to the three periods of the Earth's development. First came the age of the *geosphere*, comprised of inanimate mineral matter, followed by the age of the *biosphere*, organic matter, life. The final period corresponds to the age of the *noosphere* (from the Greek *nous*, mind), the age of human cognition.¹ As life processes radically transformed the rocky face of the earth (as the biosphere transformed the geosphere), human cognition radically transformed life itself. According to Vernadsky, the emergence of the *noosphere* corresponded to a very precise moment in time : the moment when humans mastered the principles of modern physics and chemistry, and started intervening in the nuclear structure of reality (through processes such as nuclear transmutation or the mass production of native metal and non-metallic elements). In this worldview, plate tectonics,

organisms and their interactions, and human intelligence are presented as forces of equivalent strength that transform and reshape the Earth and the cosmic space beyond. Thus Vernadsky would say that the most powerful tool humans have is their brain : “If man [...] does not use his brain and his work for self-destruction, an immense future is open before him. [...] The noosphere is the last of many stages in the evolution of the biosphere in geological history” (quoted in Smil 2002 : 13).

If Lotman does not explicitly subscribe to such an optimistic view, he nonetheless presents the constant development of innovative artistic languages, the production and renewal of semiotic codes, as a force for necessary progress and development. This is especially true of Lotman’s early works, as we will see shortly. For now, let us note how Lotman’s thoughts on cultural processes, compiled in his *Universe of the Mind* (a rather noocosmic expression we could say) are tainted by, if not deeply entrenched in the discourses of the natural sciences. In other words, if Lotman uses the semiosphere – the interactive sphere of sign process, meaning and interpretation – in analyses mainly devoted to cultural phenomena, it only makes sense when we understand how deeply related it is to the natural world. As Kull writes :

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 [...], they may have been quite necessary for Lotman himself. In any case, he was open toward the biological direction of semiotics.² (1999 : 127)

As we will now see, this biological holism is already present in the environmental and informational conception of art that is at the core of *The Structure of the Artistic Text*.

An Environmental and Informational Vision of Art

We can find such a conception in the very first pages of the book, where Lotman defines art in an informational and ecological context :

The life of every creature involves a complex interaction with its surroundings. An organism incapable of responding and adjusting to external influence would inevitably perish. Interaction with one’s environment may be viewed as the reception and deciphering of information. Man is inevitably drawn into this intensive process : he is caught up in a flow of information, life transmits its signals to him. But these signals will remain unheard, the information will not be understood, and significant opportunities in the struggle for survival neglected, if man fails to cope with the growing need to decipher this flow of signals and convert them into signs that have the power to communicate in human society. Under these circumstances, it becomes necessary not only to increase the number of diverse messages in the already available languages (natural languages, the languages of the different sciences), but to constantly increase the number of languages into

which it is possible to translate the flow of surrounding information, making it accessible. Man needs a special mechanism, a generator of more and more new “languages” to act as a vehicle for necessary knowledge. (1971 : 3-4)

Lotman then concludes that art is perfectly suited to provide new languages to satisfy humanity’s ever-renewed cognitive hunger, playing a crucial role in our ability to “respond and adjust to external influence” and to decipher the “flow of surrounding information.” The study of art is thus integrated in the broader frame of organic life, of Man’s life, a life that seems to demand the continuous production of new languages. But why is such semiotic growth necessary (we know how our civilization’s obsession with growth is ecologically problematic)? Here, it’s as if Lotman was wagering on one of the key tenets of 20th century Modernist art : the endless possibilities of artistic experimentation will help us adapt to the new political, social, cultural, economic, and physical environments of the industrialized world. Thus, art enables *any* expression and, concurrently, it enables us to express ourselves in *any* manner. But of course, it would be rash if not ingenuous to embrace such an optimistic take on art and its supposedly infinite possibilities, as art has moved elsewhere since then. The clearest example of this might be found in architecture, one of the first fields where Postmodernism became an accepted term and trend : arising in the 1950s, postmodern architecture departed from the geometrical, innovative formalism of the International style to reintroduce historical elements and references. The prevalence of quotation, recycling and remix in the last decades of the 20th century, the return to canonical forms of narrative (realism, epics) in the early 21st century signals a suspicion of pure innovation and a questioning of the need for the invention of new artistic languages, characteristic of modern avant-gardes.

In the passage quoted above, it is the need to make sense of a complex life-world that makes art a universal necessity. Humanity is here compared with an organism interacting with its environment through informational flows, flows that must be integrated to the “cultural organism” through specific languages, or sets of conventions (secondary modelling systems) : for example, understanding our chemical world demands the special language of chemical science, and the obscure complexity of human life also demands a special language, or a set of special languages : art. Such a notion prefigures the model of the semiosphere in which the mechanisms of a culture recall those of a cell : a cell reads and reacts to its environment according to its genetic profile specified by its centrally located code; similarly, a culture is organized around a set of languages that determines its boundaries and transactions with its environment. The difference between the language of chemical science, or the code dictating a cell’s behavior and art, is that art does not help humanity to understand a reality *external* to itself, but rather performs the task of explicating humanity’s *own* experience. If chemical science is a language that allows the decoding of informational

flows coming from outside humanity's membrane, art deals with the flows of the internal milieu : art is always auto-communication within a "cultural organism" (and is thus structurally homeostatic). In this sense, the languages of art as a means of self-understanding should be understood as part of a cyclical process of maintenance and cultivation and not as the teleological, linear force of progress promoted by avant-gardes (such as the Futurists, Suprematists, Constructivists...) during the early 20th century.

The homeostatic function of code (artistic languages), its role in organic life is also apparent in the following passage, where Lotman creates an intriguing parallel between information and metabolic energy :

Any sort of contact with one's environment, any type of biological assimilation represents the reception of information and can be described in terms of information theory. A system of sense receptors or a biochemical mechanism may be represented as organizations of code which decode information. [...] Let us take as a text, for example, a piece of food we are eating. The whole process of digestion can be divided into stages of interaction between nerve receptors, acids and enzymes. On every level some portion of what was not assimilated on the previous level, that is, which did not carry information, which was extra-systemic and neutral, joins in the active process of metabolism, becomes systemic and yields the information contained within itself. (1971 : 58)

To become systemic, to be integrated by the organism (or to pass through the boundaries of the semiosphere), an element needs to be decoded. Both the eating organism, and the semiosphere feeding on its peripheries, need to use the right code, or the right progression of codes, to absorb the information/energy contained in the food/text.

Lotman's early communicational approach to art thus gives a central role to code, and prefigures the concept of semiosphere. Indeed, by linking a speaker and receptor, a code also defines a specific cultural milieu. When a culture communicates with itself through a text, it encodes and decodes it in a shared language, in a shared set of conventions, in habits and expressive choices. Although denizens of a culture possess (most of) these codes, and master their native tongue, it would be more accurate to say that they are possessed by these codes, and mastered by their language and conventions. In this respect language and other cultural codes are like DNA : not created by individuals, but passed on by them. Language is not inside an individual but around it. That is why the codes and languages through which a culture communicates with itself over time form a semiotic milieu, an informational equivalent of the biosphere : a semiosphere.

It is interesting to note how the idea that the reception of information parallels biological processes is taken up again in Lotman's work on the semiosphere. Indeed, the semiosphere's vitality relies on its ability to transform external elements into systemic ones. In Amy Mandelker's reading, the semiosphere is an "entropic absorber of semiotic energy" : "[e]

nergy is generated outside, and it penetrates the semiosphere, causing “excitation” ‘Возбуждение’ of the “mother text” ‘Материнский текст’ (“текст” 10), which then rearranges its constituent elements to give birth to new meanings. [...] Without semiotic insemination, the semiosphere remains an infertile territory” (1994 : 392). While Mandelker is primarily interested in Lotman’s use of gendered images, what strikes us here is the way in which these biological images imply a cyclical logic that counterbalances the valuation of innovation, growth and progress visible elsewhere. Analogous to basic biological processes such as cellular phagocytosis, semiotic absorption appears essential to the homeostatic nature of the semiosphere, to its cycles of growth and self-description. It is toward these cycles that regulate the life of the semiosphere that we will now turn our attention.

The Semiosphere

In most of his texts concerning the semiosphere, Lotman establishes as a principle of cultural identity the dialectic between centers of cultural hegemony and the porous frontier of their peripheries. Those of us who have had the pleasure of reading and teaching Lotman in various university seminars, know that the “center VS periphery” cultural dialectic is typically the main object of discussion as we work our way through Lotman’s seminal, widely studied and cited *Universe of the Mind*. Such importance given to the semiosphere’s structural asymmetry is reflected in the work of many specialists. It seems symptomatic that approximately one third of the 25 papers presented at *Integration and Explosion*, a Lotman conference held in Konstanz in 2008, were concerned with the relationship between cultural centers and peripheries, offering critical perspectives on colonial and postcolonial dynamics, on specific situations of hegemony, and on discursive and political negotiations between powerful centers and their excluded or exploited margins.

It is not surprising that the semiosphere inspires such political interpretations, as the notion explicitly links the creation and circulation of meaning with the existence of cultural milieux. Indeed, according to Lotman, any culture functions as a semiosphere, a complex, bounded, and evolving system that is organized around specific semiotic activities, values, languages and texts. Lotman writes : “The unit of semiosis, the smallest functioning mechanism, is not the separate language but the whole semiotic space of the culture in question. This is the space we term the *semiosphere*. The semiosphere is the result and the condition for the development of culture” (1990 : 125). As such, the semiosphere is the site of power struggles and political coups where we discern a marked tendency by an elite to appropriate a selection of creations and turn them into norms and epitomes of culture. This process is closely related to what Lotman refers to as “auto-communication” (21) : “literature [art, culture] which is oriented towards auto-communication will not only avoid standard [*i.e.* unoriginal] texts, but will manifest a tendency to turn texts

into standard ones and to identify what is 'elevated', 'good' and 'true' with what is 'stable', 'eternal', *i.e.* with the set standard" (32). Thus music enthusiasts versed in Russian classical music will instantly recognize the theme of Pyotr Tchaikovsky's *Nutcracker Suite*, while fans of American jazz will also be quick to identify Ella Fitzgerald's *It Don't Mean A Thing*; both pieces of music will be considered original masterpieces, references in their respective genre. This is the result of countless articles, broadcasts, conversations, marketing strategies, pamphlets, etc. through which a culture talks to itself, constructs itself through voices of various strength and influence. Lotman writes : "culture itself can be treated both as the sum of messages circulated by various addressers [...], and as one message transmitted by the collective 'I' of humanity to itself. From this point of view human culture is a vast example of auto-communication" (1990 : 33). It is through such auto-communication that texts are turned into standards : "the 'I-I' text has a tendency to build up individual meaning and to take on the function of organizing the disordered associations which accumulate in the individual consciousness" (1990 : 29). Auto-communication plays a central role in the structuration and "homeostatic organization" of a culture and of its own semiotic space. But how did Lotman end up according so much importance to auto-communication in his model of the semiosphere?

The first chapter of *The Structure of the Artistic Text* opens with a powerful declaration that defines, in part, Lotman's methodology : "Art is one of the means of communication. Indisputably, it creates a bond between the sender and receiver (under certain circumstances both functions may be combined in one person, as in the case where a man conversing with himself is at once speaker and listener, but this does not alter matters)" (1971 : 7). Lotman thus begins his discussion of the artistic text by evoking its communicational nature, a nature that brings him to consider, without naming it explicitly yet, the possibility of auto-communication. Containing the seeds that will grow into the notion of the semiosphere, this premise is developed a few paragraphs later. Let us quote Lotman in full :

But there is something more important here : it is not uncommon to find the same individual acting as both the addresser and addressee of a message (in mnemonic devices, diaries, notebooks). Here information is transmitted not in space, but in time, and serves as a means for the auto-organization of the individual. We should consider this a marginal instance in the network of social communications, but for one problem : it is possible to view a man in isolation as an individual, in which case the scheme of communication $A \rightarrow B$ (from addresser to addressee) will clearly predominate over the scheme $A \rightarrow A'$ (where the addresser himself is the addressee, but in a different unit of time). But one has only to make "A" stand for the concept of "national culture," for example, and the $A \rightarrow A'$ scheme of communication will be just as significant as $A \rightarrow B$ (and among cultural types the former will predominate). Let us go one step further : let "A" stand for the whole of mankind. Then auto-communication will become (at least within the limits of

historically real experience) the sole scheme of communication. (1971 : 8-9)

As will be the case in *Universe of the Mind*, auto-communication here appears as a means of organizing national cultural personalities, and even, so to say, Humanity's personality, its values, desires, and goals, its ways of relating to the world. Art as auto-communication appears as a technique of maintaining a cultural system through time, and thus, in this sense, as a homeostatic mechanism that allows a culture to react and adjust to its environment. Even though Lotman's literary and cultural analysis are always grounded in national histories and specific cultural environments, by suggesting a hypothetical preeminence of the total culture of humanity in his conceptual framework, he outlines the radical, ecological ideas that will return in his theorization of the semiosphere. Indeed, the concept of global auto-communication allow us to develop hypotheses on the unfurling of human culture in a postnational world, and to better understand the recursivity at the core of the maintenance and stability through time of ecosystems and of cultural systems. For Lotman, this recursivity forms an important parallel between Vernadsky's biosphere and his own semiosphere (Kull 2015 : 7).

The Center : Codes at the Core of the Semiosphere

In the recursive process of auto-communication, a distinction is drawn between a culture and its surroundings. In a chapter of *Universe of the Mind* aptly titled "The Notion of Boundary", Lotman argues precisely this : "[e]very culture begins by dividing the world into 'its own' internal space and 'their' external space" (1990 : 131). What is ours, what we value, is placed in the middle of our world; what is not ours, what we do not consider meaningful, is relegated to the outskirts. This is a widespread phenomenon, occurring at microscopic and macroscopic levels. At a cellular level, the coding information regulating the function and identity of a cell is set in a protective envelope at the center of the cytoplasm, while the cellular membrane separates it from its surroundings, allowing the absorption and expulsion of various nutrients, molecules and metabolic residue. Cities also function in this way, from the antique polis, to the medieval, fortified burg, to the contemporary Western financial districts. We invest in the heart of power, setting in the city-centers the texts that have become our cultural codes : skyscrapers extol the opulence of capitalism, museums and concert halls celebrate authorized culture. Reciprocally, we discourage poor and homeless individuals, or marginalized social groups from being present in the prosperous districts, physically dislocating them if need be. And yet, precisely because they are so protected, the centers risk stagnation. Lotman writes :

In the center of the cultural space, sections of the semiosphere aspiring to the level of self-description become rigidly organized and self-regulating. But at the same time they lose dynamism and having once exhausted their

reserve of indeterminacy they become inflexible and incapable of further development. (1990 : 134)

We can find a similar idea in *The Structure of the Artistic Text*, where the relationship between self-description and codification is underlined. Indeed, self-description allows for the establishment of a consensual semiotic space organized around standard texts that become norms defining future possibilities of meaning. Standard art, occupying the center of the semiosphere, thus tends to transform content into code : “Here, on the one hand, there is a constant tendency for elements of content to be formalized, ossified, transformed into clichés, completely transferred from the sphere of content to the conventional realm of code” (1971 : 17). Hearing Tchaikovsky’s *Nutcracker Suite* on the radio has thus become a sign of Christmas approaching, a code with which we understand and recognize each other, through which we define our cultural habitat, our home. By structuring a habitable semiotic space, the standard text also shapes future messages :

In a good work of art everything is perceived as having been created ad hoc. But after the work has entered into the artistic experience of mankind, it increasingly becomes the language for future aesthetic communication, and that which was a fortuity of content becomes a code for subsequent messages. (1971 : 19-20)

This transformation of content into code, of an original, peripheral text into a central part of the canon, is like the transformation of wildlands into a shared habitat : the wild artistic work, shocking at first, becomes canonized and integrated into everyday life. In 1874, Claude Monet’s *Impression soleil levant* horrifies journalists; a hundred years later, it is reproduced on calendars decorating the most common of homes. This phenomenon appears especially important in Modern culture, where the quality of art stands in direct relation to its innovative capacity. Traditional societies based on folklore, or even hunter-gatherer cultures do not seem possessed of the same desire for the “taming” of wild artistic languages.

The Peripheries

Not every wild artistic text, however, is tamed. In consecrating a few elements from the margins of a culture, some, if not most of their creations are rejected. The rejects, mingling with the outsiders, participate in another radically different semio-cultural dynamic. Lotman writes :

On the periphery – and the further one goes from the centre, the more noticeable this becomes – the relationship between the semiotic practice and the norms imposed on it becomes ever more strained. Texts generated in accordance with these norms hang in the air, without any real semiotic context; while organic creations, born of the actual semiotic milieu, come into conflict with the artificial norms. This is the area of semiotic dynamism. This is the field of tension where new languages come into being. (1990 : 134)

Lotman states a clear preference for the peripheries : “The hottest spots for semioticizing processes are the boundaries of the semiosphere” (136). The centre is crystalized and predictable, the outskirts are in motion, they are the source of semiotic growth and progress.

In *Culture and Explosion*, what is foreign is similarly valued through Lotman’s discussion of communication between non-intersecting lingual spaces, where “the translation of the untranslatable may in turn become the carrier of information of the highest value” (2009 : 6). As is often the case with Lotman, we have to understand this proposition in the context of information theory (initially developed by Shannon & Weaver), with its central tenet of the most unexpected event or signal (highest entropy) being the carrier of richest information, while the likely event, the event of complete certainty, is devoid of informative value. Predictability and information are thus closely linked : coming back home and finding your TV where you expect it to be is not informative, not even noticeable, while its unpredicted disappearance will carry a significant information (*i.e.*, a break-in). When Lotman transfers this model to an understanding of art and culture, he inevitably emphasizes the informative value of unexpected messages, of foreign languages and innovative creations, and celebrates the semiotic progress and growth associated with newness. (Although we could ask ourselves who exactly would wish to live in a house where things unexpectedly appear and disappear, where entropy is high and informational flows are intense.) In contrast, the conventional center of the semiosphere, concerned with self-description and stabilization, appears as a habitable space.

In a passage from *Universe of the Mind*, the image of a habitable, safe semiosphere is opposed to that of the “invasion” of non-traditional texts : “Any culture is constantly bombarded by chance isolated texts which fall on it like a shower of meteorites. What we have in mind are not the texts which are included in a continuing tradition which has an influence on the culture, but isolated and disruptive invasions” (1990 : 18). We could imagine the centre of the semiosphere as a totally created and regulated environment, and the further out we go, into the wastelands, everything becomes more decrepit and savage. This savageness is the condition of possibility for dynamic semio-cultural innovations that (may) eventually find their way to the centre.

If, in Lotman’s view, the periphery is rich and dynamic, it seems to exist only in its relationship with the center that it feeds. While some elements from peripheries are elected to participate in the canonizing auto-communication of a culture, many are excluded. In the functioning of the semiosphere and its perpetual renewal by the absorption of its peripheries, these margins pay a certain cost. The growth and progress of the semiosphere is thus, essentially, the growth and progress of its center, feeding on the semiotic dynamism of the margins. In effect, the growth and progress of many of the so-called enlightened, modern,

liberal Western states, was made possible by the colonial or imperialistic appropriation of the energy and resources of their peripheries.

Closing Remarks

Colonial violence and exploitation may not have been Lotman's main concern when he was thinking of the "disruptive" inclusion of innovative texts at the core of the semiosphere. His valuation of the new, of growth and explosive progress must be understood in the context of a cyclical life of cultures. As Edna Andrews underlines in her introduction to *Culture and Explosion* :

[...] the inception of explosion (discontinuity) is the beginning of a new stage of development for the semiotic system that is a focal point for extraordinary expansion of information on the one hand, and a signal of the beginning of a new era on the other; however, this new stage is of a cyclic, not linear, nature, and the force of change in one area evokes an equally powerful change in the other. (2009 : xxiii)

Thus, cultural explosion and semiotic discontinuity, demanding intensive translation (not unlike the ingestion of food), are balanced by the establishment of new structural tensions and boundaries that stabilize the cultural milieu, ensuring its habitability.

The integration of aesthetic and semiotic phenomena in the sphere of the living, through information theory, at various points during Lotman's career led him from a valuation of innovation, growth and progress to a view where explosion (both creative and destructive) replaces linear logic. Indeed, for Lotman, if we adopt a more progressive world-view, "then our understanding of the concept of explosion would evoke in us such phenomena as the birth of a new living creature or any other creative transformation of the structure of life" (1992 : 10). And the structure of life is not that of pure creation, but of recursive cycles of conservation and reproduction. In one of his last interviews, Lotman muses : "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" (Kull 1999 : 125).

Notes

1. The origins of this term are unclear. Was it coined by Vernadsky, or by Pierre Teilhard de Chardin, the French geologist, palaeontologist, and Jesuit priest? Or again, by Édouard Le Roy, the French philosopher and mathematician? Whoever is responsible, historians seem to agree that the term popped up sometime in the early 1920's, in or around the halls of the Sorbonne in Paris, during Vernadsky's exile there.
2. In such openness, Lotman participated in a general rise of interest among semioticians for the role of biology, ecology and physiology in meaning-making. The clearest example of this trend can be found in the work of Thomas Sebeok on zoo- and biosemiotics, starting in the late sixties and early seventies (see for example *Perspectives in Zoosemiotics* 1972). A decade later, in France, the

exhaustion of literary semiotics will bring about a transition, in the work of A. J. Greimas himself (and the Paris School of Semiotics) from a logical, action based model of narrative (1966) to a semiotics of passion (Greimas & Fontanille 1991) attentive to affective bodily states, eventually leading Fontanille & Zilberberg (1998) to develop a phenomenologically-informed “tensive” semiotics. Umberto Eco will follow a similar path, evolving from a structural and logical study of text in *The Open Work* (1962) to considerations on the relation between the natural world and semiosis in *Kant and the Platypus* (1997). In most of these cases, the “biological turn” can be traced back to the influence of C. S. Peirce’s all-encompassing theory of semiosis, with its constant references to the natural world. For Lotman, however, other factors are involved.

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Abstract

The notion of semiosphere is certainly one of Lotman's most discussed ideas. In this essay, we propose to investigate its ecological and biological dimensions, tracing them back to Vernadsky's concept of biosphere and to Lotman's environmental vision of art articulated in his early work, *The Structure of the Artistic Text*. Our investigation reveals how the biosemiotic undercurrents in Lotmanian thought enable the emergence of a cyclical, homeostatic model of culture that counterbalances a Modernist vision of art as a force working for unquestioned linear progress.

Keywords : Biosemiotics; Semiosphere; Auto-communication; Cultural Homeostasis; Environment.

Résumé

Parmi les notions développées par Lotman, celle de sémiosphère est certainement celle qui a été la plus commentée. Dans cet article, nous explorons ses dimensions écologiques et biologiques, en remontant au concept de biosphère proposé par Vernadsky et à la vision environnementale de l'art qui apparaît chez Lotman dès *La Structure du texte artistique*. Notre enquête expose les aspects biosémiotiques de la pensée lotmanienne, aspects qui permettent l'émergence, en son sein, d'un modèle cyclique, homéostatique de la culture, contrebalançant ainsi une vision moderniste où l'art participe à un progrès naïvement linéaire.

Mots-clés : Biosémiotique; sémiosphère; auto-communication; homéostasie culturelle; environnement.

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