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The Cybernetic Layer of Juri Lotman's Metalanguage

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Résumé de l'article

Tandis que les ouvrages consacrés à l'oeuvre de Juri Lotman mentionnent souvent son intérêt pour la théorie de l'information et la cybernétique, intérêt intimement lié à son désir d'appliquer aux sciences humaines des méthodes exactes, peu d'études se sont penchées sur le sujet. Consacré à deux termes qui originent de la cybernétique et parsèment l'oeuvre lotmanienne, "mécanisme" et "*ustrojstvo*", cet article cherche à démontrer que ni leur présence ni leur usage ne sont accidentels chez Lotman et qu'ils s'inscrivent dans un axe important de sa pensée. L'auteure y présente un survol des contacts directs qu'entretient Lotman avec la cybernétique et les cybernéticiens, et de la manière dont les termes "mécanisme" et "*ustrojstvo*" ont fait leur chemin dans son métalangage. Elle explore ensuite la manière dont Lotman comprend cette paire de termes. Les problèmes de traduction qu'ils posent sont également abordés.

The Cybernetic Layer of Juri Lotman's Metalanguage

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La terminologie est le moment poétique de la pensée – G. Agamben (2007 : 7)

Introduction

It has been asserted that Juri Lotman's scientific language is characterised primarily by a lack of specific terminology. Although Lotman often emphasizes the necessity of precision in scientific language, in practice it is sometimes hard to see consistency in his own metalanguage. An important role is played here by the Russian language, which allows for constructing a series of expressions from the same root, all with differing shades of meaning by using prefixes. This makes the translators' work complicated and demands immersion in context.

Discussions of Lotman's metalanguage generally focus on a group of terms that includes text-culture-semiosphere, language, modelling systems, and translation. Meanwhile, little attention has been paid to a pair of terms with cybernetic origins found throughout Lotman's works : *mechanism* and "*ustrojstvo*". Below, I will try to show that these terms and the way they are used are not accidental but form an important part of Lotman's thought.

The connections between Lotman's theories (and generally that of the Tartu-Moscow School - henceforth TMS) and cybernetics are often mentioned, especially in the context of Soviet structuralism, but have never been subject to any serious analysis. For instance, the editorial preface to a weighty volume containing the materials of two conferences on semiotics that took place in Poland in 1965 and 1966 describes

semiotics as a scientific discipline in the following terms : "Although advanced as a discipline long ago, it is possible that it would not have developed as dynamically as it has, had it not been for the progress made in cybernetics and the theory of information." (Greimas *et al.* 1970 : V).

Richard Bailey's intriguingly titled article, "Maxwell's Demon and the Muse", begins with the bold statement that "A recurring motif in semiotics, both in the Soviet Union and in the West, is the connection between the organization of a work of verbal art and the kind of structuring explored in cybernetics, particularly by means of theories that deal with the efficiency of a channel in carrying an organized message" (1976 : 293). Western accomplishments are not discussed here, however, as the article concentrates on the Soviet context. Its focus is actually on the second law of thermodynamics, which claims that entropy always increases overtime. Bailey draws parallels between information theory and linguistics, both of which deal with the transmission of information. Bailey mainly discusses on the importance of information theory in the works of A.M. Kondratov and A.N. Kolmogorov, but he also briefly considers the case of Juri Lotman : "One of the most active theorists in developing the applications of information theory in a broad perspective is Jurij Lotman […] Lotman is quite literal in his adoption of the vocabulary and analytical method of information theory (1976 : 297). Bailey's article contains a reference to Walter Rewar's unpublished paper "The Cybernetic Aspects of Semiotics", presented at the meeting of the Modern Language Association of America, December 26, 1976, discussing specifically the situation in the Soviet Union.

In the same year another paper was published under the promising title, "Tartu Semiotics", containing numerous summaries and quotations from the first four Tartu volumes, which Rewar characterises as follows : "The composite analytic framework which emerges from the *Trudy* and comprises linguistic, information theoretical, and general cybernetic models, subsumes the idea that the subject matter of linguistics, se-miotics, and cybernetics are different from each other" (1976 : 13; see also Rewar 1989). He also analyses the use of cybernetics in Lotman in his 1979 review of Lotman's "The Analysis of Poetic Text" : "We can assume that cybernetic models are introduced because they have the capacity to uncover the regularities and the transformations at work in complex systems" (*ibid.* : 1979 : 275). The same article contains an interesting observation regarding the description of the relations between the text and transtextual structures in Lotman : "This is how we meet in Lotman's formulation Ashby's principle of *requisite variety*" (Rewar 1979 : 289). Here, Rewar refers to an article by Ashby[1] which Lotman is not likely to have read; the same principle, however, can be found in an earlier book by Ashby which Lotman did possess in his library and will be discussed below.

The connection between Soviet structuralism and cybernetics is also

discussed in most encyclopedia reviews of TMS (e.g. Petr Grzybek : "Consequently, contributions from ideologically less-sensitive domains such as cybernetics, information theory, machine translation, and structural and mathematical linguistics shaped the early structuralist discussions" [1993 : 423]). The ideological/sociological explanation of the success of cybernetics in the USSR is also mentionned by Slava Gerovitch in his magisterial study, *From Newspeak to Cyberspeak. A History of Soviet Cybernetics*, where a number of members of TMS, such as V. Ivanov, I. Revzin and Lotman, are mentioned among other researchers, stating that "these scholars saw the sought-after "exact language" of science in the formal language of cybernetics and information theory" (Gerovitch 2002 : 227). Gerovitch also notes the creative approach to cybernetics that characterized work done in the Soviet Union :

> Soviet authors realized that their versions (those cited here include Kolmogorov's, Markov's, Lyapunov's and Yablonsky's) of cybernetics differed significantly from the original Western conceptions of this field. They viewed the works of Western cyberneticians as a point of departure, rather than as a theoretical canon. (2002 : 249)

The claim that cybernetics was primarily a point of departure and the generator of individual ideas was, without a doubt, also true for Lotman.

In contrast to the authors listed above, Bogusław Żyłko focuses specifically on Lotman's metalanguage and its development in the context of his work on the concept of "culture". Among the most important sources of Lotman's new descriptive language, he lists structural linguistics, the Russian formalist school, the works of the Bakhtin circle, folklore studies, psychology (Lev Vygotsky), and film theory (Eisenstein). Żyłko notes that "With such a variety of sources, the new language of the humanities devised by the Moscow-Tartu group was not without some degree of eclecticism, even of impurity. […] Although the Russian and Estonian scholars use the notions of *sign*, *meaning*, and *language*, they avoid detailed metasemiotic discussions" (Żyłko 2001 : 392). In a recent article, Żyłko characterises Lotman's structuralism as "a hybrid in the form of structural semiotics" and, when discussing Lotman's evolution, he states that "equating structuralism with science was a conscious polemic play and […] was also the reason [why] he so often called upon the exact sciences, cybernetics, the theory of information and neurophysiology" (Żyłko 2015 : 38). In this article, he also discusses Lotman's term, "intellectual device", with a focus on the problem of the generation of meaning.

Another notable recent work in this context is Grishakova and Salupere's overview of TMS where they state : "As TMS semiotics stemmed, at least initially, from cybernetic and information science, terms such as 'machine', 'mechanism', or 'device' had a prominent place in its vocabulary" (Grishakova & Salupere 2015 : 184–185).

This short review is definitely not complete, but it should be suf-

ficiently representative to illustrate the specificity of Lotman's (and TMS') use of cybernetic terminology and information theory for resolving semiotic issues (culture, intellect, memory, etc.) through a structuralist approach to text. The next section will present a critical review of how translators have understood and relayed Lotman's "cybernetic" concepts of "mechanism" and "*ustrojstvo*".

Translation Troubles[2]

Every translation is an interpretation. The translators of Lotman's texts have not treated *ustrojstvo* and mechanism as semiotic terms of art; as a result they tend to be equated, replaced with other terms, or else left out altogether. This disregard for their difference by translators is visible in practically all translations of Lotman.[3] Below, we will discuss some of the most important and representative cases.

In the late 1970s and the 1980s, Lotman published a series of papers discussing the nature of culture, all of which use the term *ustrojstvo*. Different translators have translated these essays in a variety of languages, but the problem surrounding this term has remained the same. The French translator of "The Phenomenon of Culture"[4], for instance, has found an adequate rendition, *dispositif*, but, unfortunately, it is not used with consistency. Thus, when Lotman speaks of a "thinking *ustrojstvo*" (мыслящее устройство — one of his favourite expressions), the expression is translated as "*une machine pensante*" (1992 : 24), while on the same page, "организм (устройство)" is translated as "*un organisme (une machine)*". Then the characteristics of this "machine" are listed, after which the "*machine*" turns into a "dispositif" again on the same page, which is extremely confusing, as a single term is used in Russian throughout the text.

In "Culture as Collective Intellect and Problems of Artificial Intelligence", in which culture is considered as a collective intellect and called an "*ustrojstvo*", the term is alternatively translated as "mechanism" and "apparatus" : "Indeed, a thinking mechanism (мыслящее устройство) could [...]. An apparatus [устройство] which in principle cannot "go out of its mind" cannot be called an intellect" (Lotman 1979 : 88).

In Lotman's and Uspenskij's collaborative article "On the Semiotic Mechanism of Culture", "*ustrojstvo*" is translated as "mechanism", which only leads to confusion, since the topic of the article is the mechanism of culture. For example : "[...] culture must have within itself a structural "diecasting mechanism" [штампующее устройство]. It is this function that is performed by natural language" (Lotman & Uspenskij 1978 : 213).

In the co-authored "Theses on Semiotic Study of Culture" (1973), largely written by Lotman, both mechanism and *ustrojstvo* serve an important role. The concept of cultural mechanism is introduced in the first thesis and in section 1.2.0, and the concept of mechanism

is related to that of the *ustrojstvo*. These concepts have proven to be quite a hard nut to crack for translators. The English translator of the *Theses* (Lotman *et al.* 2013) has tried to interpret it to the best of his ability, translating the term in three different ways throughout the piece. The translator has probably not realised that the distinction between mechanism and *ustrojstvo* is important. As a result, the Russian term *ustrojstvo* is translated into English twice as "system" : "The mechanism of culture is a system which transforms the outer sphere into the inner one [...]" (1.2.0) and "[...] culture will represent not an immobile, synchronically balanced mechanism, but a dichotomous system [...]" (1.3.1); once as "arrangement" : "Thus culture is constructed as a hierarchy of semiotic systems, on the one hand, and a multilayered arrangement of the extracultural sphere surrounding it" (2.0.0); and seven times (five of them in close proximity to one another in the same paragraph) as "mechanism" : "output mechanism" (three times) and "means of this mechanism" (twice) (5.2.2), and "certain mechanism which generates these texts" and "certain collective mechanism" (6.0.0).[5]

Comparing these choices here, it is clear that this leads to confusion, since the terms, "system" and "mechanism", are otherwise used in the *Theses* and each of them forms an individual semantic field. Mixing them up in this fashion disrupts the logic of the *Theses*, since when we look at where "mechanism" and where "*ustrojstvo*" are used, the difference is rather clear. However, because Lotman's metalanguage is metaphorical and not exactly a shining example of terminological clarity, drawing this distinction can be difficult. Getting ahead of ourselves slightly, it can be said that not a single translation of Lotman has found a satisfactory solution to this problem (the issue may not be so much that of finding the proper translation as of sticking to Lotman's steady use of it : for the sake of consistency a concept should always be translated in the same way).

The distinction is also missing in *Universe of the Mind* (1990), see for example the table of contents : "Text as a Meaning-Generating Mechanism" (смыслопорождающее устройство) and "Rhetoric as a Mechanism for Meaning-Generation" (механизм смыслопорождения). In *Universe of the Mind*, *ustrojstvo* is variously translated as system, entity, object, arrangement, mechanism, apparatus (thinking[6] apparatus), and schema.

The position taken here is that the most logical translation for *ustrojstvo* should mostly be "device"[7], a term that has not been used by translators previously, as far as "official" translations of Lotman are concerned. In articles and books where Russian speaking authors writing in a different language provide their own translations, *device* is often used as the translation of *ustrojstvo*. As an example, Dmitri Segal's review of Soviet Structuralism states that "The authors have elaborated a concept of culture as 'structural stamping device', in which the language plays a role of driving mechanism or 'structural generator'" (1974 : 94). Device

is also persistently used for the translation of *ustrojstvo* by Bogusław Żyłko (2001, 2015).

Nevertheless, it is understandable why professional translators, most of them with a background in literary criticism, prefer other variants here, as in their lexicon the term "device" has been established as a concept in Russian Formalism, where it is used to translate the Russian term *priem* (see, e.g. Viktor Shklovsky's programmatic article, "Art as Device" ["Искусство как прием", 1917]). And Lotman himself has used the term *priem* in his *Lectures* : "The main handicap of the so-called 'formal method' consists in that it often led researchers to the idea that literature is a sum total of *devices*, their mechanical conglomerate" (1964 : 13) or "the metaphysical concept of '*device*' as the basis of art will be replaced with the dialectical concept of artistic function" (*ibid.* : 50). In *Culture and Explosion*, *priem* is found translated as *device* twice; the same is true for *Universe of the Mind*, where Lotman quotes Tomashevsky : "In traditional rhetoric, 'devices for changing the basic meaning of a word are termed tropes' (Tomashevsky)" (1990 : 39). Considering that for Lotman, art and artistic text are both *ustrojstvo*, translating it as "device" would leave the impression that Lotman agrees with Shklovsky in thinking that art is a *priem*. This, however, is far from true, as will be shown below.

Lotman and Cybernetics

Lotman's interest in information theory and cybernetics is closely tied to his desire to use exact methods in the humanities, which coincides with the emergence of similar tendencies in the Soviet Union in general in the late 1950s – and early 1960s.

In his methodological self-descriptions from the 1960s, Lotman always mentions information theory and cybernetics. Thus, his 1967 article, "Exact Methods in Russian Literary Science"[8], published in Italian and summarized by Umberto Eco (1990), contains the following theses : "The opposition of exact sciences and humanistic sciences must be eliminated", and "The Russian Formalists of the Twenties had initiated the study of the 'techniques' of literary phenomena but it was now time to introduce into the study of literary texts the methods of linguistic structuralism, semiotics, of information theory, cybernetics and mathematical-statistical analysis" (Eco 1990 : X).

The first version of Lotman's unpublished encyclopaedia article, "Structuralism in Literary Scholarship", characterizes structuralism as follows : "S(tructuralism) adjoins the disciplines that study communications in human society as a form of cognition and interaction (semiotics, structural linguistics, cybernetics, information theory, and others)" (quoted from Pilschschikov 2012 : 47). The question of the relationship between "Lotman the structuralist" and "Lotman the semiotician" is a separate problem; in the context of this article, it is important to note that cybernetics and information theory are present

in both cases. For example, in his 1969 newspaper article, "People and Signs", written in response to a reader's question, "What is Semiotics?", Lotman noted that semiotics as a science "originates from the fifties of our century at the cross-roads of several scientific fields : structural linguistics, information theory, cybernetics and logic" (2004 : 8). Hopefully, these examples are sufficient to show that Lotman himself recognised the importance of cybernetics and information theory in his studies.

The following section will focus on Lotman's direct contacts with cybernetics and cyberneticians, and how the terms "*ustrojstvo*" and "*mechanism*" found their way into his metalanguage. Without delving too deep into history, it is clear that the terms originate mostly in the Moscow group and its circles of mathematicians, linguists, and cyberneticians. Nevertheless, researchers from Tartu also played a part in this. Lotman began to show great interest in the studies of Tartu mathematicians and cyberneticians in the early 1960s, as he participated in seminars and invited the Moscow mathematician Vladimir Uspensky to read a lecture course on mathematical methods in literary science. In the late 1960s, Boris Egorov, Lotman's close friend and the chair of Russian Literature at the University of Tartu (where Lotman worked) from 1954 to 1960, wrote a book entitled *Cybernetics and Literary Scholarship*, which was never published.[9] The book included chapters titled 1. "Some General Principles of Cybernetics and Information Theory"; 2. "The Creation of an Artistic Work"; 3. "The Reception of an Artistic Work"; 4. "Artistic Information"; 5. "Programmed Learning".

It is difficult to believe that Lotman would not have been aware of this book. It is also worth noting that the first 1965 collective volume of the TMS journal, *Trudy po znakovym sistemam* (*Sign Systems Studies*) opened with the article, "Semiotics in Teaching", by the Tartu logician/ mathematician I. Kull, where the process of learning is framed by "the student and the teacher (or a *ustrojstvo* replacing the latter) who communicate with each other using direct communication and feedback channels" (Kull 1965 : 20).

In what follows, I will briefly sketch out the context for this cross pollination through a few key sources, and their likely influence over Lotman.

The most influential Soviet cybernetician for Lotman was definitely Andrey Kolmogorov[10] who actively participated in meetings of linguists and literary scholars[11] and who is quoted by Lotman in various articles. Kolmogorov played an important role in the first major Soviet conference on structural poetics ("Mathematical Methods of Studying the Language of Literary Texts") held in Gorky in 1961. He inaugurated the conference with a talk entitled "Combinatorial Statistics and Theory of Probability in Versification", which contained the following notable statements : "There is every reason to think that *in principle* the discrete automaton can simulate intellectual activity. [...] We must not forget that art is a

certain kind of cognition of reality, and as such has a high degree of complexity". Hence, Kolmogorov connects complexity, informativeness and literariness, and he stresses the importance of memory. But while Lotman drew on Kolmogorov's ideas, he was also influenced by A. Zholkovsky, I. Melchuk, and Y. Shcheglov's generative model "Meaning-Text".

After the Gorky meeting, the next significant event in the development of Soviet structuralism and TMS was the 1962 Symposium on the Structural Study of Sign Systems held in Moscow, an event which brought together seventeen future members of TMS. In the collection of abstracts from the Symposium, *ustrojstvo* is found (and again, lost in translation) already in the introduction by Vyacheslav Ivanov : "From the point of view of modern cybernetics, man may be seen as a mechanism [устройство] which carries out operations on various semiotic systems and texts; the program for these operations is given to man (and is partially worked out in man himself) in the form of signs" (1978 : 199).

In a book published in 1965 by two core members of TMS, we find an important definition which could have been an influential starting point for Lotman's use of the term : "A *ustrojstvo* (automaton, human, or animal), interacting with the environment surrounding it, processes the information it receives about the environment and about the device itself" (Ivanov & Toporov 1965 : 6).

Without question, however, Lotman was also influenced by the "Meaning-Text" model or theory, first put forward in Moscow in 1964 by Igor Melchuk and Aleksandr Zholkovsky. The collection of conference papers mentioned in the introduction contains their article (in Russian), "Towards a Functioning 'Meaning – Text' Model of Language", where both mechanism and *ustrojstvo* are used : "It seems natural to consider the central task of linguistics to be the creation of a working model of language – a logical *ustrojstvo* which, operating on a purely automatic basis, would be capable of imitating human speech activity. This *ustrojstvo* should be thought of as a system of data and rules […] the grammar of the 'handbook' of language. […] Language here functions as a mechanism in the full meaning of the word, namely, as a device (преобразователь) for the transformation, 'meaning-text-meaning'." (Zholkovsky & Melchuk 1970 : 159). Zholkovsky and Shcheglov presented several papers at the Symposium and subsequently also published articles in the Tartu volumes. *Ustrojstvo* and mechanism are used in all of these. In their Symposium paper, "On the Possibilities of Construction of Structural Poetics", they propose "to understand an artistic (in particular, literary) work as a *ustrojstvo* or system (the term being used here in the same sense as in structural linguistics), the action of which serves a single purpose : to cause the receiver (reader) to enter into a desired state of mind, to induce reactions sought by the author" (Zholkovsky & Shcheglov 1962 : 138). The third volume of *Trudy* contains their "Review of Soviet Works on Structural Poetics", which is a reworked version of the paper

presented at the Conference on structural poetics in Gorky in 1961 and partly repeats the text of the 1962 symposium paper, again describing a literary work as an *ustrojstvo* : "The task of scientific poetics is, then, in the most general terms, the description of a work of art as an *ustrojstvo*, acting upon a person in a certain manner (the purpose of which is also to be determined and subjected to analysis)" (*ibid.* 1967b : 367). In Zholkovsky's "*Deus ex machina*" published in the same volume, we no longer find the term *ustrojstvo*; the basic concept here is that of the "machine" : "Any artistic text is a kind of machine, which acts upon the reader's mind as a transformer, or something which at first glance can be called a machine in the figurative sense but in reality can be called such also in the serious, cybernetic sense" (1967 : 146). In this article, he describes physical, social, linguistic, natural, magical machines, universal plot machines, etc., all of which participate in an "artistic mechanism". Together with Shcheglov, they later develop their model for the generation of literary texts, the "poetics of expressiveness", of which Lotman offers a thorough criticism of in *Universe of the Mind*, noting that he is familiar with their works from 1967 ("Structural Poetics as Generative Poetics") to the early 1980s (Lotman 1990 : 72-74). In this 1967 article mentioned by Lotman, – which stands as their theoretical manifesto –, the authors declare : "If the literary work is understood as a certain apparatus for influencing the reader, then one of the goals of literary studies should be to describe the *ustrojstvo* and the work of such a machine, showing how they have been 'put together' on the basis of their thematic function." (Zholkovsky & Shcheglov 1967a : 79).

Lastly, it is worth mentioning that Lotman's own personal library[12] included roughly one hundred books and journals on cybernetics, information theory, systems theory, etc. Some of these were obviously offered as gifts to Lotman, mostly during the 1970s, and judging by their looks, they have not been read much. Of course, it is difficult to draw any conclusions here, as the library is not complete and it is also not certain if all the books found in it actually belonged to Lotman himself. Therfore, only a few of these will be discussed below.

Judging by the notes made in the books and quotes used, the most important cybernetician for Lotman was not Norbert Wiener but William Ross Ashby. His *An Introduction to Cybernetics* (1956) was translated into Russian in 1959, with a preface by Kolmogorov and edited by Lotman's friend, the mathematician Vladimir Uspensky. The book has three parts : Mechanism (sic), Variety, Regulation and Control. Ashby's first book, *Design for the Brain* (1952), was translated into Russian a few years later (*Konstruktsija mozga* 1962), but in the 1959 translation of Ashby, it is repeatedly referred to as "*Ustrojstvo* (sic) *mozga*". The book contains numerous highlights by Lotman and in addition to mechanism and *ustrojstvo*, it contains a number of other terms later frequently used by Lotman, such as "homeostat", "equilibrium stability", "homeomorphism" and "isomorphism", etc.

It seems that for Lotman, Ashby is just the kind of author who appeals to him and whom he understands. In his letter to the Polish researcher Władysław Panas, Lotman writes :

> The personality of a scholar is not only reflected in his writings but serves as a certain code for their comprehension. [...] I, for instance, find it easier to understand texts by authors I am personally familiar with and whose intonation I can reconstruct. If I do not know the author, I am compelled to construct him. If the text is so colourless that I am unable to construct its author, then I find it beyond difficult and boring to read, and I will often become convinced of its scientific futility. (Panas 2014 : 145)

The reason why Ashby appealed to him Lotman may have been that Ashby, who was a biologist, showed greater interest for "living" systems. His conception of the brain also falls in line with Lotman's – the society, the brain and living systems[13] are all intricate, complex systems, but at the same time, they all share something in common ("...cybernetics is likely to reveal a great number of interesting and suggestive parallelisms between machine and brain and society. And it can provide the common language by which discoveries in one branch can readily be made use of in the others" [Ashby 1956 : 4]). Ashby stressed the peculiar virtue of cybernetics, which "offers a method for the scientific treatment of the system in which complexity is outstanding and too important to be ignored" (*ibid.* : 4-5). Among such complex systems, he lists "the cerebral cortex of the free-living organism, the ant-hill[14] as a functioning society, and the human economic system [as being] outstanding both in their practical importance and in their intractability by the older methods" (*ibid.* : 5). Likewise, in the introduction to the papers of the first Summer school, Lotman uses a quote from Ashby, discussing namely the difficulty and the necessity of the study of complex systems.

A reference to Ashby appears also in chapter 15 ("Historical Laws and the Structure of the Text") of *Universe of the Mind* where Lotman talks about irreversible processes, dynamism, (dis)equilibrium, fluctuation and bifurcation, and the role of randomness. Here Lotman includes Ashby's definition : "By saying a factor is *random*, I do not refer to what the factor is in itself, but to the relation it has with the main system. [...]. Supplementation by 'chance' thus means (apart from minor, special requirements) supplementation by taking effects (or variety) *from a system whose behaviour is uncorrelated with that of the main system*" (Ashby 1956 : 259, cited in Lotman 1990 : 231). The presence of this citation is all the more remarkable since by the late 1980s, when the essay was written, the cybernetics framework had already fallen out of use in semiotics.

Another author worthy of discussion is John R. Pierce[15], the 1967 Russian translation of his book, *Symbols, Signals and Noise : The Nature and Process of Communication* (1962), is also found in Lotman's

library. Although the book does not contain any handwritten notes, the title is mentioned in the compulsory reading list for a lecture course prepared by Lotman (very likely in 1970; presumably, however, he was forbidden to teach the course). Mention of Pierce's work in Lotman's course materials prensents us with an opportunity to illustrate Lotman's creative use of terminology. In Pierce's book, servomechanism (a concept frequently used in cybernetic terminology) is defined as follows : "Servomechanism [the Russian term is a simple transcription of the English word] : device which acts on the basis of information received to change the information which will be received in the future in accordance with a specific goal" (1967 : 252). Ashby, too, discusses servomechanisms, but in his book they are consistently translated as следящие системы (tracking systems). Lotman presents a description completely in line with Ashby's and Pierce's style in *Universe of the Mind* : "Then the accuracy of our prediction will increase as the flight proceeds and at the same time the redundancy of the rest of the text will increase as well (by text we mean the trajectory of the stone which a tracking mechanism [следящее устройство, tracking *ustrojstvo*] synchronically outlines on its screen)" (1990 : 227). The translator, again, has not recognized the cybernetic term, while Lotman has used a curious contamination that moves through the Russian translations of Ashby and Pierce.

The next section will focus on how Lotman uses the terms mechanism and *ustrojstvo*.

Mechanism and *Ustrojstvo* in Lotman

The goal of this section is to explore how Lotman understands this pair of terms. As demonstrated above, the problem is that Lotman uses these terms in the spirit of cybernetics and the theory of information, while most translators, oblivious to this tradition, have tried to place them in the context of some sort of machinery.

Looking at the dynamics of the appearance of these terms, it can be said that both are present already in the *Lectures on Structural Poetics* (LSP); *ustrojstvo* is used only twice, but defined clearly in the spirit of cybernetics (and of Ashby) :

> This is especially clear in cases where the object of modelling is a "very big" system in the cybernetic sense of the term, *i.e.* a system, the complexity of which positively exceeds the perceptive capacity of the perceiving *ustrojstvo* (subject). In this case, the construction of a model is only possible in terms of the creation of an analogous construction. (Lotman 1964 : 37)

In the 1960s, the focus for Lotman was on the classification and division of different systems. Thus, the editorial preface (written by Lotman) to the second volume of *Trudy* contains the division of cybernetic systems that humans come into contact with. Biological structures are complex, while structures simpler than biological are elementary.

Secondary modelling systems are considered to be an interesting example of ultracomplex cybernetic structures (Editorial 1965 : 8).

The table below shows the usage of *ustrojstvo* and mechanism in Lotman's texts. The selection includes Lotman's "Trilogy" – three books that are partly overlapping and all focus on the poetic text : *Lectures on the Structural Poetics* (LSP), *The Structure of the Artistic Text* (SAT) and *Analysis of the Poetic Text* (APT, only the first, theoretical part). "Semiosfera" is a Russian collection of Lotman's essays, containing a representative sample of his work, most of which were written in the 1970s–1980s. Although *Universe of the Mind* (UM) was published in 1990, it is largely based on articles from the 1970s and 1980s (though some date back to the 1960s). Finally, the table includes Lotman's last two books : *Unpredictable Workings (in Russian Original, 'Mechanisms')* *of Culture* (UWC) and *Culture and Explosion* (CE). The table shows that in the later texts, Lotman's metalanguage begins to simplify and *ustrojstvo* completely disappears, the reasons for which will be discussed below.

The terms, "system", "structure", and "model" have been included in the table so as to offer a better sense of context. The question of whether these terms are important to and frequently used in Lotman's metalanguage in relation to *ustrojstvo* and mechanism is a complicated issue and falls outside the scope of the present article. It must be noted, however, that in the case of "system" and "structure" (which are frequently used in translations as substitutes for *ustrojstvo*), the difference lies in their level of abstractness.

	ustrojstvo	mechanism	system	structure	model	word count
LSP 1964	2	12	224	344	191	63,000
SAT 1970	7	26	300	216	69	45,500
APT 1972	0	21	209	286	57	44,700
SEMIOSFERA	91	210	684	320	259	122,000
UM 1990	24	104	228	182	81	94,000
UMC 1992	0	22	51	80	40	30,500
CE 1992	0	29	86	72	35	52,000

Figure 1

Mechanism

Unlike other TMS authors, Lotman uses the term "mechanism" in two different senses right from the beginning : as something acting, active, processual, working (in LSP we found : "rhyming mechanism", "mechanism of grammatical conjugation", "parallelism as mechanism of poetic language", "automatism as mechanism of speech", "mechanism of aesthetics", "mechanism of creation"); however, he also uses it in a passive sense, to denote a certain kind of machine :

"In any ordinary mechanism, the history of its creation is the least valued and is instantly cast aside when more perfect forms are found. For a machine equipped with a memory device (and even more so, for a human), the history of the accumulation of intellectual experience simultaneously forms the bulk of this experience" (Lotman 1964 : 48).

LSP evolves into SAT where "mechanism acquires a more abstract, more general meaning; it primarily means the mechanism of culture. The following passage is rather characteristic in this sense :

"Humanity cannot exist without a special mechanism", a generator of new 'languages' which could be used as media of knowledge. [...] Art is a supremely organized generator of a special type of languages. They render an invaluable service to humanity in organizing one of the most complex spheres of human knowledge the mechanism of which is not at all clear" (Lotman 1998a : 17).

In the articles of the 1970s, the idea of the "mechanism of culture" as a certain working principle as such, as something generative, gradually becomes easier to crystallize in the *Theses*, *cf.* : "The active role of the outer space in the mechanism of culture" (1.3.0); "The tension between them (for example, the conflict between verbal and visual text) constitutes one of the most permanent mechanisms of culture as a whole" (3.2.1); "the collective mechanism for the storage of information ("memory") ensures the transmission from generation to generation of fixed rigid schemes of texts" (6.0.2); "The text in a natural language and the picture demonstrate the most usual system of two languages constituting the mechanism of culture" (6.1.0); "In the union of different levels and subsystems into a single semiotic whole – "culture" – two mutually opposed mechanisms are at work [...]" (9.0.0); "Any significant scientific idea may be regarded both as an attempt to cognize culture and as a fact of its life through which its generating mechanisms take effect" (9.1.0).

In his article, "On the Semiosphere", Lotman brings up Saussure in relation to the concept of mechanism, speaking of the principle of symmetry/asymmetry forming the basis of communicative processes : "At the level of language this structural feature was described by Saussure as the 'mechanism of similarities and differences'"[16] (2005 : 219).

An important feature of mechanisms is their dynamicity, increasingly emphasised by Lotman : "Ambivalence as the dynamic mechanism of culture" (1977 : 205), "The oscillation between the dynamic state of linguistic non-describability and the static state of self-descriptions and descriptions made from an outer position that become part of the language, is one of the mechanisms of semiotic evolution" (*ibid.* : 207). Notably, for Lotman, one of the most important sources of this dynamicity is art : "Art is a mechanism of dynamic processes" (2009 : 152).

Ustrojstvo

The most important usage of *ustrojstvo* for Lotman is the "thinking *ustrojstvo*"; this principle is discussed in a number of articles written in the late 1970s and early 1980s. The titles speak for themselves : "Culture as Collective Intellect and the Problems of Artificial Intelligence" (1977), "Phenomenon of Culture" (1978), "Brain - Text - Culture - Artificial Intelligence" (1981)[17], "Culture and Text as Generators of Meaning" (1983).

For Lotman, text, intellect, work of art, and collective intellect (culture) all share a similar form of organization – all are similar *ustrojstvos*. In his programmatic article, "Brain - Text - Culture - Artificial Intelligence" (1981), Lotman distinguishes between three classes of intellectual objects : individual consciousness, artistic text, and culture as collective intellect. All these objects share structural and functional similarities[18] (2004c : 584). In the same article, he compares the thinking *ustrojstvo* and the machine[19] : "If we define the thinking *ustrojstvo* as an intelligent machine, the ideal of such a machine will be a perfect work of art in which the paradoxical task of combining repeatability and uniqueness is solved" (*ibid.* : 589).

All these intellectual objects are simultaneously generating *ustrojstvo*'s, consisting, in turn, of more than one text-generating *ustrojstvo* (*ibid.* : 2002 : 163).

Just as he does with "mechanism", it can be said that Lotman uses *ustrojstvo* in two different senses. *Ustrojstvo* appears as an object, something that is observed, that is capable of acting, and is organised in a certain manner. On the other hand, he uses the word in the sense of "organization" and "design" (*cf.* the translation of the title of Ashby's book *Design for the Brain – Ustrojstvo mozga*). *Ustrojstvo* in the first sense is, for example, "thinking *ustrojstvo*"; see also : "This will allow our scheme to embrace those cases where language links two *ustrojstvo*'s of transmission and reception, rather than two individuals (for example, a telegraph linked to an automatic recording *ustrojstvo*)" (Lotman 1998a : 21). This can be called the "more cybernetic" sense.

Lotman pays a lot of attention to the construction, the design of the *ustrojstvo*. For instance :

> Thus both the individual, and the collective consciousness, contain two types of text-generator : one is founded on [mechanism of – missing in translation] discreteness, the other is continuous. In spite of the fact that each of these mechanisms has a self-contained structure [имманентен по своему устройству], there is a constant exchange of texts and messages between them. (1990 : 36)

Or : "A culture that is oriented not towards an increase in the quantity of texts but on the repeated reproduction of texts once and

forever established requires a collective memory with a different *ustrojstvo*" (*ibid.* : 247). In his 1983 article, "Asymmetry and Dialogue", he presents an even more "cybernetic" expression of this idea : *ustrojstvo* is here akin to a "black box" : "Immanent mechanisms of culture appear as *ustrojstvo* which, upon receiving as their input impulses from the outside extra-cultural reality, output texts which, in turn, may become their input" (2004d : 600). In yet another example, Lotman describes the structure of the text (expanding the same description also to culture) using *ustrojstvo* in the sense of "design, organization" :

> [...] the minimum structure of the text is the presence of two semiotically autonomous subtextual formations and a semiotic metastructure connecting them. A fundamental feature of this structure is the trinity of this mechanism, the fact that each of its parts can, to a certain extent, function completely independently of the others while at the same time, in another aspect, they form an indivisible functional whole. This *ustrojstvo* is what enables the text to become a meaning generator in place of a passive transmitter of enclosed meanings. (1982 : 4)

Ustrojstvo is related to the understanding of culture as a collective intellect, as an organism : "Let us imagine a certain organism (*ustrojstvo*) which to all external stimuli has only two reactions" (2004b : 577). A similar comparison is found in an earlier article, "The Stage and Painting as the Coding *Ustrojstvo* of the Cultural Behaviour of the People of Early 19th Century", written in 1973 : "[...] culture is a self-adapting living organism. The possibility of choice on different levels, the intersection and free "play" of different types of organization form the minimal set of necessary cultural mechanism" (1998b : 645). In the article, "On the Semiosphere", the analogy with an organism has been expanded even further, so that "all semiotic space may be regarded as a unified mechanism (if not organism)" (2005 : 208). For Lotman, this space/mechanism/organism is the semiosphere. It may be asked here, why does he use the term, mechanism, rather than *ustrojstvo*, as in the previous examples. The possible reason for this is the greater degree of "materiality" of *ustrojstvo*. If we compare the usage of mechanism and *ustrojstvo* in the first "tangible" rather than processual or organizational sense, then mechanism is always more abstract and more general. This is clearly visible in Lotman's descriptions of culture where he uses both mechanism and *ustrojstvo*. For instance, the theses state that "the mechanism of culture is a *ustrojstvo* which transforms the outer sphere into the inner one" (1.2.) or "[...] culture will represent not an immobile, synchronically balanced mechanism, but a dichotomous *ustrojstvo*" (1.3.1.).

The table below shows how Lotman uses mechanism and *ustrojstvo* in the description of culture.

Culture as Mechanism	Culture as Ustrojstvo
a unified, simultaneously operating mechanism	culture is constructed as a hierarchy of semiotic systems, on the one hand, and a multilayered *ustrojstvo* of the extracultural sphere surrounding it
semiotic mechanism, mechanism of knowledge	
a mechanism of collective intelligence	an intellectual *ustrojstvo*
a mechanism for organizing and preserving information in the consciousness of the community	certain collective *ustrojstvo* for the storage and processing of information
a mechanism creating an aggregate of texts	certain *ustrojstvo* which generates these texts

Figure 2

As discussed above, *ustrojstvo* is completely absent in Lotman's later books, but the phenomenon itself and its features are still present. This is especially clear in discussions of art and the artistic text, where Lotman now uses the term, "thinking structure", in place of "thinking *ustrojstvo*" : "The artistic work is a thinking structure, a generator of new information. Art is one of the hemispheres of the collective brain of mankind" (2013 : 220). In the introduction to the same book, *ustrojstvo* is evident in the background of "organization" : "My goal is more modest : to outline the common features of structural descriptions of culture and tentatively to suggest the place of such descriptions in broader and more general forms of organization" (*Ibid.* : 53). In *Culture and Explosion,* we find humans described as "thinking reed", which could also be considered a metaphorical substitution for *ustrojstvo*.

The conclusion of the *Universe of the Mind* started with : "The individual human intellectual apparatus [интеллектуальный аппарат] does not have a monopoly in the work of thinking" (1990 : 273). As we can see, *ustrojstvo* is replaced here with apparatus. The rest of the conclusion also avoids using *ustrojstvo,* while mechanism is still present :

> We are both a part and a likeness of a vast intellectual mechanism. [...] whether we are studying the structure of the literary text, the functional asymmetry of the hemispheres of the brain, the problems of oral speech or of deaf and dumb language, the advertisements of our modern age or the religious ideas of archaic cultures – we find the different mechanisms of the single intellectual life of humanity. (Lotman 1990 : 273)

The table below presents a summary of what Lotman has called a

ustrojstvo and what he has called a mechanism.

Mechanism(s)	*Ustrojstvo*
a single ideal lanuage representing an optimal M. for the expression of reality	an intelligent U. capable of putting out new messages we shall call creative consciousness
meaning-making M., meaning-generation M., text generating M.	Thinking U.
M. of (self-)consciousness, M. of transmitting and receiving, M. of asymmetry, M. of chance, M. of the brain	**Symbol** - profound coding U.
Lingual M., rhetoric M., memory M., replication M.	Text as a constantly repeated U., as a meaning generating U., as a thinking U.
City - a complex semiotic mechanism, a culture generator	Text-producing U.
Translation - a basic M. of consciousness, the elementary M. of translating is dialogue	Literary narrative - the most flexible and effective modelling U.
Cultural tradition - M. for recoding	normalizing U.
Boundary - mechanism for translating texts	Language, stage, painting as coding U.
central myth-forming M. of cultutre	cyclical mythological U.
cyclical time of M. texts	

Figure 3

This table should shed a light on Lotman's choices in *Universe of the Mind* : he titles the first part, *The Text as Meaning-Generating Ustrojstvo*, described in the preface as follows : "Part One considers the mechanism of meaning-generation as a result of the mutual tension between such mutually untranslatable and at the same time mutually interprojected languages as the conventional (discrete, verbal) and the iconic (continuous, spatial)" (1990 : 3). Indeed, in this part Lotman focuses on communication mechanisms (chapters : "Autocommunication : 'I' and 'Other' as Addressees"[20], "The Text as Process of Movement : Author to Audience", "Rhetoric" as a mechanism for meaning-Generation and "Iconic Rhetoric").

Some Concluding Remarks

In his writings, Lotman has repeatedly emphasised the importance of terminological accuracy; yet in spite of this, he has often been accused of unclear term usage and not of defining his terminology. Indeed, reading his works individually, outside the context of his entire body of work, much may remain unclear. This is illustrated by a quote

from Sergey Daniel :

> Expanding the field of his research activities, he employed terminology
> from various sciences, merging concepts where he found it heuristically
> useful and introducing new ones. I remember a short dialogue between
> Lotman and an educated lady. She was quite perplexed : is it really right
> to use this term in connection with that kind of a phenomenon? Well, as a
> matter of fact, said Lotman, you can use any term you wish; the scientific
> principle, however, tells you that if you use a term in a specific sense on
> the first page, you cannot change it at your whimsy on the next. (2002 : 10)

Insofar as the terms "mechanism" and "*ustrojstvo*" form the
cybernetical layer in Juri Lotman's metalanguage, he was truly con-
sistent in their usage and this should not be ignored. For Lotman,
cybernetic metalanguage was a common language that enabled treating
extremely dissimilar phenomena as homogenous. It may be assumed
that he was inspired in this by Ashby's claim that "[...] cybernetics is
likely to reveal a great number of interesting and suggestive parallel-
isms between machine and brain and society. And it can provide the
common language by which discoveries in one branch can readily be
made use of in the others" (1956 : 4).

The much-discussed difference between the early and the late
Lotman, – the former being a typical (static) structuralist and the latter
becoming, in the 1980s, a post-structuralist with the appearance of
dynamics, the category of time, etc. – seems to be exaggerated, how-
ever. I completely agrees with Natalya Avtonomova, who writes that :

> In reality, the impression of the radical novelty of the late Lotman may
> arise from looking at him from the outside. If we immerse ourselves in Lot-
> man's works themselves and follow his scientific biography step by step,
> then the image of the new Lotman [as] post-structuralist (or Lotman the
> communicationist or dialogist) will hardly be as convincing. Something
> that has been considered a radical change will appear more like a new
> accent, a shift in attention, occasionally, a new manner of expressing his
> thoughts, [that is]more familiar and more habitual to today's world (no-
> body ever talks about cybernetics anymore); in any case, however, not as
> abandoning his principles of work which were formed in the 1960s and
> developed throughout his entire life. (2009 : 217)

This is also the kind of consistency that this article has attempted
to highlight.[21]

Notes

1. "Variety, Constraint and the Law of Requisite Variety" (1968), where this
    principle is defined as follows : "In order to maintain and to adapt itself to an
    ever-changing environment, a system must contain at least as much variety
    as there is in the environment to which it is adapting" (Ashby 1968 in Rewar
    1979 : 289)
2. Part of the materials used for this section have been published previously in
    Salupere & Torop (2013 : 28-30).
3. This is mainly in reference to English translations. It would definitely be

illuminating to also review and compare German translations of Lotman, which are quite numerous. Interestingly, the Estonian translation of Lotman's "Brain-Text-Culture-Artificial Intelligence" contains exactly the same kinds of errors as do the English ones : *ustrojstvo* is variously translated as mechanism, system, (thinking) unit, object; system is replaced with mechanism, mechanism with system, etc. The collection of Lotman's translations in which it appears was published in 1990, but the translations themselves were made in late 1970s and early 1980s.

4. The article in question has not been translated into English but the term "thinking device", repeatedly occurs in Lotman's works. The problem of the nature of human thought, of intelligence, was of great interest to Lotman from the beginning of his cybernetic ventures in the 1960s to the end of his life

5. It should be noted that the Italian translation has found an adequate term, *congegno*, with [*ustrojstvo / system*] added in brackets. It is not used consistently in the rest of the text. Thus in 2.0.0, it is translated as *ordinamento* and in 5.2.2. as *meccanismo* (Ivanov *et al.* 2006).

6. The Russian title of *Universe of the Mind* is Внутри мыслящих миров (*Inside Thinking Worlds*).

7. Of course, this choice is not without its drawbacks. For instance, it does not reflect an important seme present in the original "organization".

8. The article is probably a version of "Литературоведение должно быть наукой" ("Literary Scholarship Must be a Science"), published in Russian in *Voprosy literatury* in the same year.

9. Parts of the first and fifth chapter have been published in the journal, Критика и семиотика (see Egorov 2004-5).

10. Lotman and Kolmogorov became acquainted at Vladimir Uspensky's in May 1965.

11. He also published ten articles on the theory of verse and was the opponent of Mikhail Gasparov's doctoral thesis in 1977.

12. Lotman's library and part of his archive are located in the Estonian Semiotic Repository Foundation (Tallinn); unfortunately, the materials found there have not yet been catalogued.

13. Lotman has a short article titled "Culture and Organism" that was only published in Estonian (1984).

14. Note here Lotman's comparison of the collective intellect with the ant's nest in the article, "The Phenomenon of Culture".

15. The written Russian form of his name is identical to that of Charles Sanders Peirce – "Pirs", which has given reason to suspect that Lotman may have confused the two.

16. Saussure's *Cours* contains a section entitled, "Mechanism of Language", where he discusses syntagmatic and associative relations and the absolute and relative arbitrariness of the sign.

17. Published in *Semiotics and Information*.

18. In a later (1983) article, "Culture and Text as Generators of Meaning", published in *Cybernetical Linguistics*, he uses the terms "isostructurality" and "isofunctionalism" (Lotman 2002 : 163).

19. *Cf.* Zholkovsky's 1967 definition above : "Any artistic text is a kind of machine".

20. A word-for-word reproduction of Lotman's article, "Two Models of Communication in the System of Culture" (1973).

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Bibliography

AGAMBEN, G. (2007) *Qu'est-ce qu'un dispositif?* Paris : Éditions Rivage

ASHBY, W. R. (1956) *An Introduction to Cybernetics.* New York : John Wiley & Sons.

AVTONOMOVA, N. (2009) *Открытая структура : Якобсон—Бахтин—Лотман—Гаспаров.* Moskva : РОССПЭН.

BAILEY, R. W. (1976) "Maxwell's Demon and the Muse". In *Dispositio* (1) 3 : 293-301.

DANIEL, S. (2002) О Лотмане. In Лотман Ю М. *Статьи по семиотике культуры и искусства.* Спб. : Академический проект : 5-16 .

ECO, U. (1990) "Introduction". In Lotman, Y. M. 1990. *Universe of the Mind : A Semiotic Theory of Culture.* A. Shukman (Trans.). London-New York : I.B. Tauris : VII-XIII.

Editorial (1965) Предисловие. *Труды по знаковым системам* (*Sign Systems Studies*) (2) : 5-8.

EGOROV, B. (2004) Программированное обучение (из книги "Кибернетика и литературоведение"). *Критика и семиотика* (7) : 279-295.

_____. (2005) Из книги "Кибернетика и литературоведение". *Критика и семиотика* (8) : 285-292.

GEROVITCH, S. (2002) *From Newspeak to Cyberspeak. A History of Soviet Cybernetics.* Cambridge, Massachusetts : The MIT Press.

GREIMAS, A.J., R. JAKOBSON, M.R. MAYENOWA, S.K. ŠAUMJAN, W. STEINITZ, S. ŻÓŁKIEWSKI. (1970) "Foreword". In Greimas *et al.* (Eds.). *Sign. Language. Culture.* The Hague–Paris : Mouton : V-VI.

GRISHAKOVA, M. & S. SALUPERE. (2015) *A School in the Woods : Tartu-Moscow Semiotics.* In Grishakova, M. & Salupere, S. (Eds.). *Theoretical Schools and Circles in the Twentieth-Century Humanities : Literary Theory, History, Philosophy.* London-New York : Routledge : 173-195.

GRZYBEK, P. (1993) "Moscow–Tartu School". In Preminger, A. & T. Brogan, V. F. (Eds.). *The New Princeton Encyclopedia of Poetry and Poetics.* Princeton : Princeton University Press : 422-425.

IVANOV, V. Vs. (1978 [1962]) "The Science of Semiotics". In *New Literary History* (9) 2 : 199-204.

IVANOV, V. V. & V. TOPOROV. (1965) *Славянские языковые моделирующие семиотические системы (Древний период).* Москва : Наука.

IVANOV, V. V. & J. M. LOTMAN, A. M. PIATIGORSKIJ, V. N. TOPOROV, B. A. USPEN-SKIJ (2006) "Tesi per un'analisi semiotica delle culture". In Lotman, J. *Tesi per una semiotica delle culture.* Roma : Meltemi : 107-148.

KULL, I. (1965) *Семиотика и обучение. Труды по знаковым системам* (*Sign Systems Studies*) (2) : 11-21.

LOTMAN, Ju. M. (1964) Лекции по структуральной поэтике. *Труды по знаковым системам* (*Sign Systems Studies*) (1) : 5–195.

_____. (1977 [1974]) "The Dynamic Model of a Semiotic System". In *Semiotica* (21) 3/4 : 193-210.

_____. (1979 [1977]) "Culture as Collective Intellect and the Problems of Artificial Intelligence". Shukman, A. (Trans.). O'Toole, L. M. & A. Shukman (Eds.). In *Dramatic Structure : Poetic and Cognitive Semantics.* ("Russian Poetics" in *Translation* (6)) Oxford : Holdan Books : 84–96.

_____. (1982) От редакции. *Труды по знаковым системам (Sign Systems Studies)* (XV) : 3-9.

_____. (1990) *Universe of the Mind : A Semiotic Theory of Culture.* Shukman, A. (Trans.) London-New York : I. B. Tauris & Co. Ltd.

_____. (1992) *Le phénomène de la culture. Meta : journal des traducteurs* (37) 1 : 18–28.

_____. (1998a [1970]) Лотман Ю.М. Структура художественного текста. In *Лотман Ю.М. Об искусстве. Санкт-Петербург : Искусство – СПБ* : 14-285.

_____. (1998b. [1973]) Сцена и живопись как кодирующие устройства культурного поведения человека начала XIX столетия. In Лотман Ю. М. *Об искусстве*. Санкт-Петербург : Искусство-СПБ : 636-645.

_____. (2002 [1983]) Культура и текст как генераторы смысла. In Ю. М. Лотман. *История и типология русской культуры*. Санкт-Петербург : Искусство-СПБ : 162-168.

_____. (2004a[1969]) Люди и знаки. In Лотман Ю. М. *Семиосфера*. Санкт-Петербург : "Искусство-СПБ" : 5-11.

_____. (2004b [1978]) Феномен культуры. In Лотман Ю. М. *Семиосфера*. Санкт-Петербург, Искусство-СПБ : 568–580.

_____. 2004c [1981]. Мозг — текст — культура — искусственный интеллект . In Лотман Ю. М. *Семиосфера*.Санкт-Петербург, Искусство-СПБ : 580–589.

_____. (2004d [1983]) Асимметрия и диалог. In Лотман Ю. М. *Семиосфера*. Санкт-Петербург, Искусство-СПБ : 590–602.

_____. (2005 [1984]) "On the Semiosphere". In *Sign Systems Studies* (33) 1 : 205-228.

_____. (2009 [1992]) *Culture and Explosion*. Grishakova, M. (Ed.). Berlin : Mouton de Gruyter.

_____. (2013 [1992]) *The Unpredictable Workings of Culture*. Tallinn : TLU Press.

LOTMAN, Ju. M. & V. V. IVANOV, A. M. PJATIGORSKIJ, V. N. TOPOROV, B. A. USPENSKIJ, (2013 [1973]) "Theses on the Semiotic Study of Cultures (as Applied to Slavic Texts)". Salupere, S., P. Torop & K. Kull (Eds.). In *Beginnings of the Semiotics of Culture. Tartu Semiotics Library* 13. Tartu : University of Tartu Press : 53-77.

LOTMAN, U. (1978) "On the Semiotic Mechanism of Culture". In *New Literary History* (9) 2 (*Soviet Semiotics and Criticism : An Anthology*) : 211-232.

PANAS, P. (2014) "Semiotics of the 'Fourth Generation' – an Unfinished Project?" In *Sign Systems Studies* (42) 1 : 137-146.

PIERCE, J. R. (1967 [1962]). *Символы, сигналы, шумы. Закономерности и процессы передачи информации*. Москва : Мир.

PILSHCHIKOV, I. (2012) Невышедшая статья Ю. М. Лотмана "Структурализм в литературоведении". *Русская литература* (4) : 46–69.

REWAR, W. (1976) "Tartu Semiotics". In *Bulletin of Literary Semiotics* (3) : 1-16.

_____. (1979) "Cybernetics and Poetics : The Semiotic Information of Poetry". In *Semiotica* (25) 3/4 : 273-305.

_____. (1989) "On Hierarchy, Extension, and Boundary in the Cybernetic Modeling of the Literary Text". In *Semiotica* (75) 3/4 : 229-255.

SALUPERE, S., & P. TOROP (2013) "On the Beginnings of the Semiotics of Culture in the Light of the Theses of the Tartu-Moscow School". In Salupere, S., P. Torop, & K. Kull (Eds.). *Beginnings of the Semiotics of Culture* (Tartu Semiotics Library 13). Tartu : Tartu University Press : 15-37.

SEGAL, D. (1974) *Aspects of Structuralism in Soviet Philology*. Tel-Aviv : *Papers on Poetics and Semiotics* (2). http://www.tau.ac.il/tarbut/pubtexts/segal/Segal-Aspects.pdf (accessed 14 April 2016).

ZHOLKOVSKY, A. (1967) "Deus ex machina". *Труды по знаковым системам* (*Sign Systems Studies*) (3) : 146-155.

ZHOLKOVSKY, A. & I. A. MEL'CHUK (1970) "К построению действующей модели языка ("Смысль-Текст"). In Greimas *et al.* (Eds.). *Sign. Language. Culture*. The Hague–Paris : Mouton,159-194.

ZHOLKOVSKY A. & Y. SHCHEGLOV (1962) О возможностях построения структурной поэтики. In *Симпозиум по структурному изучению знаковых систем. Тезисы докладов*. Москва : Изд-во АН СССР : 138-141.

_____. (1967) Структурная поэтика – порождающая поэтика. *Вопросы литературы* (1) : 74-89.

_____. (1967b) Из предыстории советских работ по структурной поэтике. *Труды по*

знаковым системам (*Sign Systems Studies*) (3) : 367-377.

ŻYŁKO, B. (2001) "Culture and Semiotics : Notes on Lotman's Conception of Culture".
     In *New Literary History* (32) 2 : 391-408.

_____. (2015) "Notes on Yuri Lotman's Structuralism". In *International Journal
     of Cultural Studies* (18) 1 : 27–42.

Abstract

Most accounts of Juri Lotman's legacy note his interest in information theory and cybernetics which is closely tied to his desire to use exact methods in the humanities. However, this connection itself has hardly been studied. This article focuses on a pair of terms with cybernetic origins found throughout Lotman's works : "*mechanism*" and "*ustrojstvo*". I try to show that these terms and the way they are used are not accidental but belong to an important strand in Lotman's thought. An overview is presented of Lotman's direct contacts with cybernetics and cyberneticians, and how the terms "*ustrojstvo*" and "mechanism" found their way into his metalanguage. The main focus is on exploring how Lotman understands this pair of terms. Translation problems related to them are also discussed.

Keywords : Cybernetics; Metalanguage; Translation; Lotman; Semiotics; Structuralism; Mechanism; *Ustrojstvo*.

Résumé

Tandis que les ouvrages consacrés à l'oeuvre de Juri Lotman mentionnent souvent son intérêt pour la théorie de l'information et la cybernétique, intérêt intimement lié à son désir d'appliquer aux sciences humaines des méthodes exactes, peu d'études se sont penchées sur le sujet. Consacré à deux termes qui originent de la cybernétique et parsèment l'œuvre lotmanienne, "mécanisme" et "*ustrojstvo*", cet article cherche à démontrer que ni leur présence ni leur usage ne sont accidentels chez Lotman et qu'ils s'inscrivent dans un axe important de sa pensée. L'auteure y présente un survol des contacts directs qu'entretient Lotman avec la cybernétique et les cybernéticiens, et de la manière dont les termes "mécanisme" et "*ustrojstvo*" ont fait leur chemin dans son métalangage. Elle explore ensuite la manière dont Lotman comprend cette paire de termes. Les problèmes de traduction qu'ils posent sont également abordés.

Mots clés : Cybernétique; métalangage; traduction; Lotman; sémiotique; structuralisme; mécanisme; *Ustrojstvo*.

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