

# Totality of semiosphere

Review: Jesper Hoffmeyer, *Signs of Meaning in the Universe*.  
Bloomington: Indiana University Press, 1996<sup>1</sup>

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The book by Jesper Hoffmeyer is, to the best of my knowledge, the first monograph (and not a mere set of articles by one or more authors) on biosemiotics. This makes it exceptionally important not only for laymen, but also for many biologists and philologists/ linguists, often ignorant of the very existence of such a neighbouring discipline.

The book under review has an additional meaning and importance due to its style, which is not purely academic rather written for the general reader, and thanks to its author, an experienced journalist and a youth leader from the 60s (besides his molecular genetic background). This genre (full of metaphors and poetic expressions) though makes it hard to criticise the book from a professional position and the discussion is only possible if we avoid being too scholarly and exact.

The reviewer, however, cannot totally avoid such dry matters, as, for example, the notion of sign, because in the understanding of this notion Hoffmeyer (p. 18) follows Peirce, whereas the reviewer adheres to de Saussure. It may be true that, in the light of U. Eco's (1984) work, the controversy of these two positions should not be deemed very important, but, despite perceiving the irrelevance of a detailed discussion of the question, I would like to point out one circumstance.

The point is that Peirce's (or, more exactly, Peirce's in Hoffmeyer's treatment) understanding of sign involves the question, what is not a sign? After all, any measuring device satisfies the definition of a sign as "a relation between three factors: (1) ... the sign vehicle ...; (2) the object ... to which the sign vehicle refers ...; and (3) 'the interpretant' i.e., the system which construes the sign vehicle's

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<sup>1</sup> For other reviews of J. Hoffmeyer's book look *Semiotica* 120(3/4), 1998.

relationship to its object” (p. 19). But measuring devices are only physical objects and hardly signs, although they are calibrated. There exist some purely physical processes, in which a kind of calibration takes place, for example the selection of particles by oscillation when building into a crystal under certain conditions. Another example is a kind of calibration of small trigger-type fluctuations, which provokes phase transitions from metastable states. It seems that there is no reason to presume semiosis in all these cases such as the above. Or, if we do, one has to imagine what physics and chemistry would be rewritten in semiotic terms.

This is the point where de Saussure’s approach to the sign, as based on the idea that the sign is not a mere conjunction of two fragments of the world thanks to ‘the interpretant’, but an intersection of two different worlds, one of which is the world of sense, seems to be preferable. In such an approach, there will be no sign where there is no sense, as in physical or chemical processes.

De Saussure’s approach has the advantage of delimiting the boundaries of the science of semiotics not coinciding with the boundaries of knowledge in general, while Peirce’s approach does not do this, since he understood “logic ... as the science of the general laws of signs” (p. 18). We have to remember that in Peirce’s time nothing was known about those quite common small trigger-type fluctuations that provoke phase transitions from metastable states, which are now widely investigated in different fields: in the theory of dissipative structures, nonequilibrium thermodynamics, theory of catastrophes, etc., not to mention the very wide application of triggers, primarily electronic ones, in modern engineering. Of course one may use such a general understanding of sign as an aggregate of any two fragments of the world and then discriminate between two types of signs — signs of natural objects and signs of sense. Instead, I would call the first of them symptoms, usable for object identification and reconstruction from fragments, whereas the second would be called signs, the semiotic means. It is obvious, however, that the perception of such signs in nature will be strongly hampered by the problem of detecting the sense.

This could be done in one of at least two ways.

First, one can go the way of descriptive analysis, which would be quite natural for modern science. Then the analysis of distributions would allow us to suppose sense in a succession of sign vehicles. What is more, the nature and procedures of distribution analysis, as

such, are quite similar to genetic recombinant analysis, while genetic systems are the first to make us think that living beings are of a semiotic nature. So why does there not exist the descriptivist descriptions of biosemiosis, especially since in that case the Peirce's understanding of the sign would be applicable?

Second, one can take the mentalist way, based on the direct perception of sense in a situation. It is worth noting, in this context, that the idea of semiosis is not only relevant to the notion of hereditary code, but also stands as a basis for the central dogma of molecular biology. The heuristic productivity of the idea of code in biology is really astonishing! The presumption of sense, however, in living beings meets the difficulty of the double standard used in anthroposemiotics and biosemiotics.

On the one hand, anthroposemiotics emphasises arbitrariness and freedom in establishing the relation between the plan of expression and the plan of content for an anthroposemiotic sign. Such an approach is, however, based on the study of phenomena without any interest to the problems of neuro- and psychosemiotics, which makes it short on empirical data.

On the other hand, both the methods, used for studying biosemiosis, themselves and the wish to answer the questions posed by anthroposemioticians (and particularly, by linguists) lead to the situation that in biosemiotics the mechanisms are better studied. The paradox is that anthroposemioticians studying phenomena, when they are presented with some mechanisms witnessing biosemiosis, treat the fact of the existence of mechanisms as an indication of the inexistence of semiosis, since semiosis, in their opinion, should be free of mechanisms.

This problem is formulated by J. Hoffmeyer as the possibility to overcome "Descartes' old dualism ... only ... by reducing ... psychological phenomena to mechanical occurrences" (p. 69). Though such a statement seems inadequate, it is in good accordance with the idea that the ultimate element of sense in biosemiotic systems is the relationship between adapter and acceptor in tRNA.

It is quite understandable, of course, that such a statement is too new for those who deal with anthropomorphic thesauri only. For non-anthropomorphic, biological thesauri, however, it is natural to suppose some unusual forms of sense. It seems that such a kind of sense is present in the relation between adapter and acceptor.

Therefore RNA (more exactly, the whole RNA/DNA system of the cell, cf. pp. 44, 81) is a real semiotic means, a sign (true, in this context the book discusses almost only DNA — pp. 20–21, 31–33, 44–50, 78, etc. — although when speaking of the ‘DNA code’ — pp. 29, 42–43 — RNA is obviously implied).

Thus we can see from the above, that the difference between the adepts of the two approaches of understanding semiotics, which also determines the difference in the understanding of the subject of biosemiotics, is rather significant, but leads to the discussion of the same biosemiotic problems. So it may be more heuristic to discuss not biosemiotics, but the semiotic approach in biology, which is applicable not only to biological signs (if they exist), but also to the whole biological reality. The scope of biology for a semiotic approach will be the same for both positions (Peircean and Saussurean), and it would be sensible to discuss heuristic value of such an approach. This value is, however, beyond doubt, as illustrated by the book under review.

It is characteristic for many branches of biosemiotics and semiotics in general that the historical aspect is ignored. This is especially common in semiotic studies of genetic code, which is the best object for biosemiotic studies. Genetic code is viewed as though it has appeared in its final form; attempts to search for its origin meet with serious problems. The book under review is very interesting in this respect, since it includes biosemiotics in the framework of evolutionary biology and evolutionary science as a whole (beginning with the big bang (p. viii) and ending with the appearance of ethics (Ch. 10)). Semiosis becomes a component of Cosmos formation, a total process of semiosphere formation (see particularly pp. 142–146). Origin of genetic code (Ch. 2) is also interpreted from the historical point of view, as well as the problem of correspondence between adapter and acceptor.

Thus biosemiotics is inscribed into known evolutionary material. Such a construction is quite usual and comprehensible for biologists. Most important, the author gives an essay not simply of biosemiotics, but of evolutionary biosemiotics, or, as Frederik Stjernfeld has said (p. 78), the “natural history of signs”. The idea of evolutionary biosemiotics is even used as a principle for chaptering the book (main chapters from the 2nd to the 10th), together with acquiring the “greater and greater semiotic freedom” (p. 78). But further on the same page, the author gives an outline of the progress of semiotic

freedom, which substitutes, in the book as a whole, the history of the phenomenon for the genetic scheme of the phenomenon, without mentioning that these two may not always be identical. Here we have another matter for discussion.

This confusion may be taken lightly, but not here in Russia, where the most heated discussion on evolution of the 20th century took place, from L. S. Berg's (1922) and D. N. Sobolev's (1924) nomogenesis to the modern works of S. V. Meyen and the group of paleontologists led by V. V. Zherikhin and A. S. Rautian (Rautian, Kalandadze, 1993). The discussions were especially intense since the Marxist dogma of historical interpretation expanded far beyond its field and was applied with all rigidity to even the least relevant things with corresponding practical consequences.

It was revealed in the course of these discussions that very many quasievolutionist constructions can be adequately represented by a correct description of typological universum and the possible (and realisable) displacement trajectories of empirical objects (individual and collective) within the space of this universum. In such a way an internally correct comparative version can be constructed for any discipline — comparative anatomy, comparative physiology, comparative cytology, etc.

The most enlightening result of such studies is the work of S. V. Meyen on the relation of nomothetic and historical aspects of evolution (Meyen, 1973). As an example of the realisation of the post-critical standard of evolutionary concepts elaborated in the course of these discussions, the work on phytospreading by the same author (Meyen, 1987) can be mentioned. The book under review is devoid of such refined methodological reflection, and can be qualified as a logically irreproachable essay of comparative biosemiotics.

Nonetheless, the proposed principle of growing semiotic freedom can be compared, both in content and in system forming capacity for corresponding disciplines, to Teilhard de Chardin's principle of cephalisation (Teilhard de Chardin, 1966) or to I. I. Schmalhausen's principles of autonomisation of ontogenesis (Schmalhausen, 1969: 359–362).

The book contains many interesting ideas and considerations important for biosemiotics *sensu stricto* (not including bioanthroposemiotics), which are worthy of special discussion: the problem of the re-creation of the universe (p. 5), heredity as semiotic survival (p. 24), vertical vs. horizontal semiosis (p. 32), discussion of G. E. Hutchin-

son's idea about "the evolutionary drama in ecological theatre" (p. 33; very close to the ideas of St.Petersburg theoretical biologists of the 80s), the idea of living creatures as messages (p. 46), or of self-reference and self-description and their role in biosemiosis (p. 48), comparison of genome and cookery book (p. 48), interaction of digital and analogue code (pp. 49–50), evolutionary incorporation of the present in the future (p. 51), discussion of J. von Uexküll's concept of *Umwelt* (pp. 54–59), relation between the notions of information and form (pp. 62–66), delineating the position of biosemiotics among other disciplines (Fig. 12, p. 96), and others. Also, chapter 9 should be noted, which is devoted to one of the author's favourite themes, semiotics of corporeal consciousness (body-mind).

For discussion and illustration of his ideas, the author uses the very latest interesting facts and materials, including such an intriguing idea as the "unconscious control of sperm production", being a "clear proof of the existence of sperm rivalry in human beings" (p. 68).

Also the works referenced in the book are worthy of note classical authors H.-G. Gadamer, S. Kierkegaard, M. Merleau-Ponty, Ch. Peirce, K. Popper, J. von Uexküll, L. Wittgenstein, as well as the most significant papers of the last decades by R. Dawkins, Ch. deDuve, R. L. Gregory, D. R. Hofstadter, G. Lakoff, R. C. Lewontin, Yu. M. Lotman, H. Maturana & F. Varela, M. Polanyi, I. Prigogine & I. Stengers, J. R. Searle, Th. A. Sebeok. This shows that biosemiotics is now not an intellectual back water, but a mainstream discipline.

In conclusion, the value of J. Hoffmeyer's book is beyond any doubt, since it proposes the system of a new science of biosemiotics, showing internal relations between its questions, outlining relevant material and tracing relations to other disciplines. In addition, the system proposed is understandable and familiar to professionally thinking biologists and other naturalists. Of course, another author will construct a somewhat different system, but, even as subjective as it necessarily is, the system under review allows us to map a new scientific field, to create corresponding divisions in bibliography, to prepare curricula for students in biosemiotics, etc. In this connection, the popular character of the book is of some advantage again.

In closing, I would like to say some words about the book's national origin. The aura of Danish culture (and Scandinavian as well) emanating from the text in English is, in my opinion, very welcome for the scientific society, since the language barrier usually hampers

our familiarisation with regional cultures. I am very pleased to learn many thoughts of Danish poets, philosophers, scholars, and statesmen.

On the other hand, the book is unfortunately quite typical in its scarce referencing of Russian materials. The reason for this is obviously the same barrier plus the iron curtain not so long ago. For example, the works of A. S. Famintzin and I. V. Baranetsky (1860's–1912) or C. S. Mereschkovsky (1905–1909) are not mentioned when discussing the theory of symbiogenesis. There are no echoes of the 70s Tartu discussions on biosemiotic problems (Morozov, 1978), or their follow-up in the late 80s in Moscow University (Sharov, 1990).

One of the author's failures is corrected by himself in Note 1, where he recognises that the term 'semiosphere' was introduced by Yu. M. Lotman (p. 147). Another significant omission is the absence of reference to the book 'Semiotics' by Yu. S. Stepanov (1971), where the very term of biosemiotics was first introduced (to the best of my knowledge). By the way, that important work was also written for the general reader.

In my opinion, the poor acquaintance of the West with Russian cultural worths is regrettable, and not only for general reasons but for the special reason that the ideas of biosemiotics have found fertile ground here because of the Orthodox tradition, where all living beings are considered semiotic in principle; also some traces of the corresponding attitude to the Word, text, icon remain in the Russian mentality. This tradition is accessible not only through the works of Russian Silver-Age emigrant philosophers, but is also reflected in the semiotic papers by R. Jakobson, who absorbed some Orthodox ideas during his formative years. *Hermeneutica sacra* is traditionally taught in Russian Orthodox theological colleges and academies even today, without any interruption. Therefore, we can say that in Russia both biosemiotics and biohermeneutics now exist (Chebanov 1995; cf. works of the Laboratory of Molecular Hermeneutics, University of Connecticut Health Center). It is remarkable that this was perceived by a foreign observer G. Sermoniti (1994), who writes that in modern Russian biology one can see the realisation of P. A. Florensky's *Iconostasis*.

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