

Semiosis and Quasi-Minds: Charles Peirce's Unfinished Semantic Theory

Suren Zolyan

Immanuel Kant Baltic Federal
University, Kaliningrad, Russia;
Russian-Armenian University,
Yerevan, Armenia
e-mail: surenzolyan@gmail.com

Abstract—The intensive development of artificial intelligence, as well as describing bio-molecular processes of transmission of genetic information, makes it actual to address the problem of a semiotic activity that is not based on human cognition or mind. In this capacity, we address Charles Peirce's chronologically last and mainly unpublished conception of semiosis. Semiosis is considered as an interpretation, but it does not imply any kind of interpreter external to a sign. A sign is considered a quasi-mind. Semiotic operations are performed by signs, more precisely, by quasi-minds welded into them: by a quasi-utterer and a quasi-interpreter. Semiosis is described as consistently carried out personalized interaction of structural components (quasi-minds) of the same process. A quasi-utterer is associated with an object, and a quasi-interpreter is associated with an interpreter. As a development of Peirce's sign conception, it may be the theory of semiopoiesis, understood as a semiotic manifestation of autopoietic processes.

Keywords—Non-cognizant semiotic agents, Charles Peirce, sign, interpreter, interpretant, sign as a quasi-mind, semiopoiesis.

I. INTRODUCTION

Is it possible to have a semiotic activity that does not involve cognition or the mind? Can a semiotic system act as an agent or a subject? These and similar questions, which until recently were ignored or considered absurd, receive unexpected relevance in connection with the problems raised, on the one hand, by the intensive development of artificial intelligence, and on the other, by the description of biomolecular processes of transmission of genetic information. Meanwhile, the possibility of non-cognizant subjects interpreting messages was already provided in the theoretical constructions of the great philosopher and logician, one of the founders of modern semiotics, Charles Peirce. One of the main ideas of Peirce's semiotic theory is a concept of an Interpretive semiosis, which does not imply any subject endowed with mind and brain. Peirce addressed the problems of a sign throughout his scientific life; he introduced numerous, sometimes differing definitions of signs. However, despite all the differences, it is evident that eliminating an interpreter from interpretative processes was his well-thought-out research position.

According to Jürgen Habermas, the mind, as well as the interpreter, are absorbed by the structure of the sign: "because it consists of nothing other than that three-placed relation of representation in general; it is absorbed by the structure of the sign" [1, 247].

However, Peirce comes to a complete rejection of the concept of an interpreter only in his latest version of semiotics, it mostly remained in handwritten sketches under the name "Pragmatism - Notes and Drafts" [2]. Peirce abstained from publishing them because he reasonably assumed they would be misunderstood. It is also essential to consider that in Peirce's time, neither artificial intelligence nor molecular genetics were known, which could help Peirce develop his concept.

II. SIGN AS A QUASI-MIND

Peirce understood sign relations as algebraic, which is why the interpreter factor turns out to be redundant: "A sign is something, A, which brings something, B, its interpretant sign, determined or created by it, into the same sort of correspondence (or a lower implied sort) with something, C, its object, as that in which itself stands to C. This definition no more involves any reference to human thought than does the definition of a line as the place within which a particle lies during a lapse of time" [3, p. 54].

As Peirce pointed out, semiotic relations may not presuppose an agent with intelligence; they can be carried out by a kind of "quasi-mind," "quasi-intelligence," associated with operations on signs and inherent to sign and sign system. The sign appears as an agent of such operations, therefore, according to Peirce, the sign is a (quasi-) thinking being, or a quasi-mind: "... as every thinking requires a mind, so every sign even if external to all minds must be a determination of a quasi-mind. The quasi-mind is itself a sign, a determinable sign" [4, 195].

Peirce defines a sign not through its paradigmatic and syntagmatic relations with other signs, as is customary in Saussurean semiotics, but through interactions in the chain of signs generated and generating through it. First of all, these are sign's closest "neighbors" in this sequence: the quasi-utterer and the quasi-interpreter:

“The action of a sign generally takes place between two parties, the utterer and the interpreter. They need not be persons; for a chameleon and many kinds of insects and even plants make their living by uttering signs, and lying signs, at that. Who is the utterer of signs of the weather... ? However, every sign certainly conveys something of the general nature of thought, if not from a mind, yet from some repository of ideas, or significant forms, and if not to a person, yet to something capable of somehow ‘catching on’ ... that is, of receiving not merely a physical, nor even merely a psychical dose of energy, but a significant meaning” [2, 195].

Sign is manifested in three hypostases, and an interpreter appears not as a subject external to a sign, but as a result (more precisely, a process) of the bifurcation of the quasi-mind, as something welded into a sign:

“Thought is not necessarily connected with a brain... Admitting that connected Signs must have a Quasi-mind, it may further be declared that there can be no isolated sign. Moreover, signs require at least two Quasi-minds; a Quasi-utterer and a Quasi-interpreter; and although these two are at one (i.e., are one mind) in the sign itself, they must nevertheless be distinct. In the Sign they are, so to say, welded” [5, 4.551].

Further development of semiosis appears as a sequentially carried out personified interaction of structural components (quasi-minds) of the same semiosis. The key to understanding this recursion can be found in another handwritten note:

“Before the sign was uttered, it already was virtually present to the consciousness of the utterer, in the form of a thought. But, as already remarked, a thought is itself a sign, and should itself have an utterer ... and so back” [6, 403].

A quasi-utterer is associated with an object, and a quasi-interpreter is associated with an interpreter. The quasi-utterer, who is a sign-masker, also represents (personifies) some pre-semiotic or extra-semiotic relationship between an object and a sign. An object (the implied first speaker) creates a meaningful connection between signs and the objects. An object determines a sign an utterer, and a sign determines an interpreter. Then, the newly formed interpretant becomes a sign-object and the process of secondary semiosis starts, when the already pre-semiotized sign correlates with the implied second quasi-uttering object. This gives rise to a second interpretant with an implied second quasi-interpreter. At the first stage, these quasi-minds act as utterers and interpreters of *thought*, at the next stages, as utterers and interpreters of sign¹. At each stage, new signs arise.

Semiosis appears as a self-generated processuality, independent of human thinking. A thought-sign replaces an articulated sign and thereby received a form (literally: a *moulded* sign), which in turn becomes a mental sign, and so on. Infinite semiosis, the theory of which, relying on Peirce, was subsequently developed by Umberto Eco [8], [9].

Nevertheless, according to late Peirce, it can (if not should) have limits:

The next step toward our definition is the consideration that a chain of signs that conveys a given meaning can in many cases, at any rate, be neither beginningless nor endless. Still, it must be of a mental nature. There must then be some other mental element than a sign that can endow a sign with a meaning; and someone upon which the meaning can ultimately be expended. [2, 196]

However, there was no clear continuation, so one can only guess how Peirce could clarify the interpretation that Umberto Eco subsequently gave to his theory. It is obvious, however, that, according to Peirce, the final point, if it were found, would have to be not a physical object, but a *mental element*, that is, some new thought-sign, and then the process of semiosis should again be set in motion, giving rise to new semiotic quasi-utterers and quasi-interpreters.

In the continuation of the above reasoning, a somewhat strange machine-reaction hybrid appears: the mind can be roughly defined as the creator of signs associated with the reaction machine, which comes into action from weak excitations; ... *a mind may, with advantage, be roughly defined as a sign creator in connection with a reaction-machine. A reaction-machine is very delicately susceptible... to physical forces* [2, 197].

Let us recall again the above remark of Habermas: the reason here is nothing more than a three-place relation of representation as a whole; it is absorbed by the structure of the sign. Thirty years ago, one of the most significant philosophers of the twentieth century foresaw that discoveries in the field of genetics and artificial intelligence would give new life to Peirce's ideas, previously unnoticed:

“Peirce spoke of quasi-minds, because he wanted to conceptualize the interpretation of signs abstractly, detached from the model of linguistic communication between a speaker and a hearer, detached even from the basis of the human brain. Today this makes us think of the operations of artificial intelligence, or of the mode of functioning of the genetic code” [1, 245].

Let us provide just one, but the most essential instantiation for this. All information diversity in DNA and RNA are encoded by four biochemical macromolecules, the nucleotides: adenine, guanine, cytosine and thymine (in RNA it is replaced by uracil). Nucleotides are also non-elementary entities and can be represented as a set of two differential features: a) the number of rings and b) the number of hydrogen bonds. This makes it possible to convert semiotic nucleotides into double-byte units of digital information. Thus, there is an initial distinction between pyrimidines (one ring) and purines (two rings). Then within each of the groups, secondary differentiation may be introduced. As a result, with purines one may distinguish between nucleotides with three (guanine) and two bonds (adenine), and, accordingly, with pyrimidines,

conveyed to that quasi-mind, from same anterior utterer of the thought, of which the utterer of the moulded sign had been the interpreter. The meaning of the moulded sign being conveyed to its interpreter, became the meaning of a thought in that quasi-mind; and as there conveyed in a thought-sign required an interpreter, the interpreter of the moulded sign becoming the utterer of this new thought-sign” [2, 206-207].

¹ This is our understanding of Peirce's handwritten sketch, (see also the commentary on this passage in [7, 217-218]: “A sign is whatever there may be whose intent is to mediate between an utterer of it and an interpreter of it, for being repositories of thought or quasi-mind by conveying a meaning from the former to the latter. We may say that the sign is moulded to the meaning in the quasi-mind that utters it, where it was, virtually at least, (i.e. if not in fact, yet the moulding of the sign took place as if it has been there.) already an ingredient of thought. But thought being itself a sign the meaning must have been

between nucleotides with three (cytosine) and two (uracil) bonds [10]. These semiotic nucleotides can be converted into a digital ones as the abovementioned differential features may be expressed in the digital terms of 0 and 1 (or 1 and -1), as it was suggested in [11], [12].

III. THE NEW LIFE OF PEIRCE'S UNFINISHED CONCEPTION

Modern researchers mostly prefer to ignore Peirce's hesitations; apparently, due to their incompleteness, it is not possible to offer an unambiguous interpretation of them (cf.: [13, 211], [14, 144]. At the same time, in the spirit of Peirce's original approaches, a less binding and broader notion of interpretation is needed instead of understanding. The latest results in molecular genetics allow us to better understand how interpretation is possible without an interpreter external to the system – as a result of self-organization.

Deacon, without mentioning Peirce's unpublished reflections on the quasi-interpreter and the quasi-speaker, considers the conditions under which a molecule becomes a semiotic system. He directly points to a problem posed but not clarified by Peirce:

“In Peircean terms, this amounts to asking what sort of molecular system is competent to produce the interpretants that can bring this re-presented property into useful relation with that system? In an age when neuroscience was in its early infancy and molecular biology was not even imaginable, it is not surprising that he avoided speculating about what sorts of dynamical systems were competent to be interpreters. Because of the vast complexity of brains and despite remarkable advances in neuroscience, it may still be premature to speculate about the neural implementation of mental semiosis. On the other hand, there are reasons to be more hopeful that insights into the physical implementation of interpretation might be obtained within molecular biology” [15, 540].

As one can see, semiosis can be described as a sequentially carried out personified recursive interaction of structural components (quasi-minds) of the semiosis itself. A quasi-utterer may be associated with an object, and a quasi-interpreter may be associated with an interpreter. A quasi-utterer, who is the producer of signs, also represents (personifies) some pre-semiotic or extra-semiotic relationship between an object and a sign. Semiosis appears as a self-generated processuality that can be independent of human thinking.

A logical extension of the Peirce sign concept can be the theory of codepoiesis [16] or semiopoiesis [17], [18], as a symbolic manifestation of autopoietic processes. In addition to the consideration of semiopoietic processes at the micro-(bio-molecular) level, another direction of application and development of Peirce's theory in relation to macro-level objects can be Yuri Lotman's concept of a semiotic "I". According to Y. Lotman, complexly organized semiotic objects (i.e. text, culture, semiosphere) acquire the characteristics of both an organism and an intellectual device and are capable of autonomous activity: “The individual human intellect does not have a monopoly in the work of thinking. Semiotic systems, both separately and together as the integrated unity of the semiosphere, both synchronically and in all the depths of historical memory, carry out intellectual operations, preserve, rework and increase the store of information [19, 273].

Such an understanding has already made it possible to understand more deeply how a uniform approach to the description of evolutionary processes is possible, both in relation to biology and to the development of language and culture (cf. [20]). Peirce's incomplete semantics provides a methodological basis for such developments.

The birth of life involves controlling complex information processes, it leads to the first semiotic relations expressed in genetic coding. Moreover, the functioning of the semiosphere and biosphere assumes the presence of some semiotic relations; they arise as mutually binding and determining factors. The Peircean conception of semiotic quasi-minds can clarify the characteristics of semiosis as an intrinsic dynamic process of systemic self-organization and self-development (in this capacity Yuri Lotman used Heraclites's concept of the “self-growing Logos”).

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REFERENCES

- [1] J. Habermas, “Peirce and communication”. *Kenneth L. Ketner* (ed.) *Peirce and contemporary thought: Philosophical inquiries*, Fordham Univ Press, USA, pp. 243-266, 1995.
- [2] Ch. S. Pierce, *Pragmatism - Notes and Drafts* On-line; available: <https://fromthepage.com/jeffdown1/c-s-peirce-manuscripts/ms-317-318-1907-pragmatism-notes-and-draftsPeirce MS 317-318>.
- [3] Ch. S. Pierce, [Parts of Carnegie Application] (L 75). *Peirce Ch. S. The New Elements of Mathematics*, Mathematical Philosophy, Mouton Publisher, vol. 4, pp. 13—73, 1976.
- [4] Ch. S. Pierce, *Semiotic and Significs: The Correspondence between Charles S. Peirce and Victoria Lady Welby*. Edited by Charles S. Hardwick, Bloomington: Indiana UP, 1977.
- [5] Ch.S. Peirce, *The collected papers of Charles S. Peirce*, edited by C. Hartshorne, P. Weiss, Harvard Univ. Press, Cambridge, Mass. Peirce., vols. 1-6, 1931-1958.
- [6] Ch. S. Peirce, *The Essential Peirce: Selected Philosophical Writings*. Peirce Edition Project. Indiana UP, vol. 2, 1998.
- [7] D.L. Gorlee. *Semiotics and the Problem of Translation. With Special Reference to the Semiotics of Charles S. Peirce*. BRILL, Amsterdam: University of Amsterdam, 1974.
- [8] U.E. Eco, *Drift and Unlimited Semiosis*. Indiana University Press, Bloomington, IN, USA. 1990.
- [9] U.E. Eco, *Interpretation and Overinterpretation*. Cambridge University Press, Cambridge, 1992.
- [10] S. Zolyan, “On the minimal elements of the genetic code and their semiotic functions”, *Biosystems*, vol. 231, September 2023, 104962 - <https://doi.org/10.1016/j.biosystems.2023.104962>
- [11] C. Carter, W. Jr. & R. Wolfenden, “Acceptor-stem and anticodon bases embed amino acid chemistry into tRNA”, *RNA Biology*, vol. 13, pp. 145-151, 2016, doi:10.1080/15476286.2015.1112488.
- [12] C. Carter, W. Jr. & R. Wolfenden, “tRNA Acceptor-Stem and Anticodon Bases Form Independent Codes Related to Protein Folding”, *Proc. Nat. Acad. Sci. USA* vol. 112, pp. 7489-7494, 2015, doi: www.pnas.org/cgi/doi/10.1073/pnas.1507569112 (2015).
- [13] Sharov, Alexei & Tønnessen, Morten. *Semiotic Agency. Science beyond Mechanism*, Springer, 372 p., 2021.
- [14] S. Brier, & C. Joslyn, “What does it take to produce interpretation? Informational, Peircean and code-semiotic views on biosemiotics.” *Biosemiotics*, vol. 6(1), pp.143–159, 2013.
- [15] T.W. Deacon, “How Molecules Became Signs”, *Biosemiotics*, vol 14, pp. 537–559, 2021, <https://doi.org/10.1007/s12304-021-09453-9>
- [16] M. Barbieri, “Codepoiesis – the Deep Logic of Life”, *Biosemiotics*, vol. 5, pp. 297–299, 2012, <https://doi.org/10.1007/s12304-012-9162-4>

- [17] S. Zolyan, "From Matter to Form: the Evolution of the Genetic Code as Semio-Poiesis, *Semiotica*", no. 245, pp. 17–61, 2022, doi: <https://doi.org/10.1515/sem-2020-0088>.
- [18] S. Zolyan, "Semio-poiesis: on the emergence of the semiosphere within the biosphere", *Lexia. Rivista di semiotica, N. 39-40 Re-Thinking. Juri Lotman in the Twenty-First Century*. pp. 101–120, 2022, doi: 10.53136/97912218042636pp. 101-120.
- [19] Y. Lotman, *Universe of the Mind: A Semiotic Theory of Culture*, Tauris. London and New York, 1990.
- [20] B.O. Küppers, *The Language of Living Matter. How Molecules Acquire Meaning*, Springer Cham, 2023, doi: <https://doi.org/10.1007/978-3-030-80319-3>