C.S. PEIRCE'S INFLUENCE ON THE LOGICAL WORK OF N.A.VASILIEV

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Abstract
The article deals with heuristic influence of C.S.Peirce logical ideas on the construction of imaginary, non-Aristotelian logic (free of laws of contradiction and excluded middle) by N.A.Vasiliev (1910-13) and circumstances accompanied and made easier its creation.

How the radically new, revolutionary ideas in the science are emerging? What we can say about the nutrient medium, favoring the birth of such ideas? What mechanisms of their maturing? The problems mentioned belong mainly to the psychology of scientific work and may be treated only on the basis of huge empirical data from various fields of research. Those data concerning the circumstances of new crazy ideas birth in the long or short run became the cornerstones of original academic conceptions, theories, directions of research.

The important ingredients of creativity are the "prompts" of some kind which makes the creation easier, enables to   seek   for and   find   new approaches, encouraging the scholar in persuasion to fulfil the task, overcome the handicaps on the way for the discovery. Heuristic prompts may be of unexpected origin and nature, from sudden areas of life and knowledge. These prompts may be some sort of vague "sensations", implicit for the time being, ideas, uncertain waitings, in lucky combinations and circumstances becomes the catalysts of new fruitful approaches and outstanding discoveries.

As A. Weyl stated in "From metaphysics   to   mathematics": every mathematician is aware that there is nothing in the way of heuristic influence that is more fruitful than some vague similarities, dim glimmers of one theory to another, which are like "furtive endearments and inexplicable disagreements" [Weil 1980, p. 408]. Yu.I.Manin citing this thought reminds us of the metaphysics of infinitisimals - the system of vague and hardly formulated analogies, which nevertheless played a the crucial role in the scientific discovery" [Manin, 1984, p.47].What vague similarities, uncertain and hardly formulated analogies have feed the work of N.A.Vasiliev, the forerunner of modern non-classical logics? To my mind they are   explicable, namely Ch.Peirce's logic of relatives, became known to Vasiliev when he was only 17, symbolist-style poetry, paid much attention to another   worlds subject, the special psychological standpoint, used for the critical analysis of Aristotelian logic and, at last,   Ch.Darwin's ideas of organic world evolution.

The present article deals only with prompts Vasiliev received from Ch.Peirce's ideas, though the rest channels of heuristic influence are worthy to study and even instructive [Bazhanov, 1990 a].

Nicolai A.Vasiliev (29.6.1880 - 31.12.1940) was Professor of Philosophy   at   Kazan University. As early as in 1910 in his "imaginary logic" he abandoned the law of contradiction and constructed the logic without this law. That's why he deserves the name of paraconsistent logic founder. Exactly in paraconsistent logic was formally incarnated the idea of NON-Aristotelian logic in stict sense, - the idea have been excited the scholars mind in the fall of XIX - turn of XX centuries. The severe critic and giving up the law of excluded middle makes Vasiliev the forerunner of one more – alternative to classical - logic, - intuitionistic. Due to introduction of new classes of judgements (and truthfulness values) Vasiliev may be considered as a founder of logic, expanded the possibilities of classical one - multi-valued [Bazhanov, 1988, 1990].

Vasiliev's way to imaginary logic, became precursor of the modern non-classical logic, was steep and toilsome. The starting point of his way to be found in youth animations and

"vague sensations" of the future scholar. The first heuristic prompts were received by 17 old Vasiliev due to concising Ch.Peirce work on logic of relatives [Peirce, 1897]. The point is that young Vasiliev was deeply interested in psychology and logic. In the surprisingly serious diary young Vasiliev paid much attention to making summaries of definite logical works.

Almost all logical works accessible to young Vasiliev were done in the context of Aristotelian logic traditions.

Ch.Peirce's article written in different manner stand out against a background of Aristotelian paradigm papers. Making it summary Vasiliev noticed that in Aristotelian logic theory of judgements implies the existence in the judgement of subject, predicate and copula, while in the logic of relatives the theory of judgements not exhausted with characteristics of predicate, belonging to subject, but based on far more broad understanding of relations among things. In the logic of relatives we have not two, as in Aristotelian logic, but at least three terms of judgement.

We may argue that in Ch.Peirce's logic of relatives Vasiliev perceived the evidence of Aristotelian logic imperfection, the narrowness of traditional theory of judgements and it elements, he realized the principal possibility of different ways of logical reasoning, the non-absolute character of classical logic and its basic laws.

Here he found an example of that "obscure opposition" to the traditional theory of judgements, - opposition encouraged him in constructing the radically novel classification of judgements, served as a foundation for imaginary logic and rejection of central logical principles. The acquintance with Ch. Peirce work the ideas of which goes beyond the Aristotelian logic, was the certain kind of "imprinting" (to use the biological term), later made easier the imaginary logic ideas delivery. Suffice is to say, that not accidently the first step towards novel logic was the critics of traditional classification of judgements and intention to propose the original method of propositions classification and understanding.

Likely that Ch.Peirce article at first was noticed by Nicolai Vasiliev's father Alexander V.Vasiliev, the prominent mathematician and social figure. In 1894 he published a small book, devoted to the life and work of N.I.Lobachevsky. (Until his death A.Vasiliev constantly worked on the book expanding it in the light of new historical data; in 1927 A.Vasiliev's book - nearly 700 pages - was published, but all copies were totally destroyed; only in 1992 we'll see at last the book published).

In 1895 Ch. Peirce wrote a review of A.Vasiliev's book English translation by Halsted. The review was known to A. Vasiliev as well as Ch. Peirce's works and activity, which he highly appreciated and paid special attention to them.

Worthy to note that logic of relatives ideas in the late XIX century in Russia were vigourously developed by N.Y.Grot. In the book "On the reform of logic", published in 1882 N.Y.Grot presented the ideas consonant to Peirce's ideas (with reservations that Grot and Peirce belonged to different paradigms). Grot's style of logic of relatives construction was rather close to N.A.Vasiliev ideology and ideas. Both scholars share the psychologists standpoint (platform) in logic. For Grot was the chief editor of journal "Voprosy philosophii i psychologii"(Problems in philosophy and psychology), read regualarly by N.A.Vasiliev, Grot's ideas, according to his 1908 Account [Vasiliev, 1989], were known to the later.

The most supporters of psychologism were opposed to the mathematisation of logic. However N.A.Vasiliev on the contrary declared that this process enables to open new horizons of the development of logic. Though he didn't used the methods of mathematical logic (being acquinted with them at least in general terms), his psychologism helped to propose radically new - non-classical in essence - systems of logic, supposed formalisation by means of mathematical logic. By the way in 1909 Ch.Peirce accused himself of psychologism.

The second "confrontation" meeting of N.A.Vasiliev with Ch. Peirce ideas took place in 1908 at Third International Philosophical Congress and third meeting in 1910 exactly fixed in Annals of history. N.A.Vasiliev concentrated on non-Aristotelian logic idea, drawn the attention to the article by Paul Carus [Carus, 1910], contained long quotations from Ch.Peirce

letters. At the present article author's archive of Vasiliev's family library the issue of "Monist", 1910 with P.Carus paper have been keeping, full of N.A.Vasiliev annotations.

The notion of non-Aristotelian logic at the turn of the XX century was pretty general contained only the idea of abstract possibility of its construction: "Aristotelian logic is incomplete and ineffective, though no mistakes are not yet founded in it", - Carus stated, manifesting the opinion of radically disposed member of scientific community towards Aristotelian logic. In favor of his standpoint P.Carus have been cited Ch.Peirce letters dealt with question at the point.

Before starting the algebra of relatives Vasiliev studies Ch.Peirce, according to one letter, "a little bit studies" the hypothesis consequences that the logical laws might differ from the known to the end of XIX century (unfortunately Peirce didn't clarified the details, vital in the case given). The acception of such hypothesis lead to some sort of non-Aristotelian logic. Some aspects of the study seemed "interesting" to him, but not enough important for publication.

Ch.Peirce categorically opposed to those scholars, who rejected the possibility non-Aristotelian logic beforehand as false, as "crazy" instead of considering this - quite natural - hypothesis as worthy of investigation, notwithstanding it truthlikeness.

In another, complementary to the previous letter Peirce elucidated that he never excluded the continuation of early non-Aristotelian logic studies. They at least might reveal logic features out of the sight up to the momentous. "But I have decided at that time that this direction of research is not so important" [Carus, 1910, p.158].

The quoted letter undoubtlessly showed that construction of non-Aristotelian logic Peirce bounded with the modification of transitivity law. P.Carus disagrees with Ch.Peirce approach towards non-Aristotelian logic nature and method of construction. He stressed that Ch.Peirce treatment of Aristotelian (and non-Aristotelian) logic factually presupposes the different, rather then commonly excepted, understanding of logic and nature of non-classical logic.

Besides the transitivity law never have been included into the row of Aristotelian logic basic laws thus being far from it central principles. That's why in P.Carus account the modification (or even abandoment) of transitivity law cannot be consider as the starting point of non-Aristotelian logic build up.

N.A.Vasiliev, perhaps, only fixed attention at this article by P.Carus with Ch.Peirce's letters for already in May 1910 at the trial lecture he proposed a novel non-Aristotelian logic system based on new classification of judgements. In the October of the same year the lecture was published in the brochure form.

At last in the crucial for imaginary, non-Aristotelian logic article "Logic and metalogic" (1912-13) N.A.Vasiliev would note that, unfortunately, he is forced to put aside the assesment of various prominent logician ideas, Ch.Peirce's amidst them [Vasiliev, 1989].

Ch.Peirce and N.A.Vasiliev were thinking, so to speak, in one direction - if we mean the creation of non-classical logic.

Conjectures of not universal character of the laws of (non)-contradiction and excluded middle, perhaps, stroke Ch.Peirce's mind in the fall of XIX century. Since the turn of the XX century Ch.Peirce not only expressed his doubt in the university of these laws, but have been making attempts to construct the systems of multi-valued logic, limiting the scope of the law of excluded middle. Along with this I do not aware of Ch.Peirce's desire to build logic, tolerant to contradiction, though he was "suspicious" to this law.

Thus N.A.Vasiliev from the start out of conscious (even not academic) life have been known of Ch.Peirce logical achievements as some sort of heuristic prompts, made easier to find the new ways of non-Aristotelian, imaginary logic. They were among the building facilities of novel logical constructions.

The other heuristic prompts, as I have had already mentioned, were symbolist-style poetry, the peculiar - psychological - treatment of logical realities /for details see [Bazhanov,1988]/, the evolutional conception of Ch.Darwin [Bazhanov, 1990 a, b].

Thus we could more clearly imagine what "vague analogies and sensations" followed N.A.Vasiliev on his way to imaginary, non-Aristotelian logic, what implicit ideas and similarities fitted his work.

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