Review of the book: *N.A. Vasilʹev and His Imaginary Logic*

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In a book that appeared in 2009 in Russia, Valentin Bazhanov\(^1\) presented a biography of N. A. Vasilʹev\(^2\) (1880-1940), which has been a Professor in the University of Kazan at the beginning of the last century. Vasilʹev invented a logical system that he named *imaginary logic*. His logical program anticipated some of the more fecund lines of contemporary logic.\(^3\)

Bazhanov brought to us many facts concerning the personal and intellectual life of Vasilʹev, which unfortunately have remained in the shadows until our days.

This brilliant Professor of Kazan, has given much proof of his multifarious talent during his life. He was a medical doctor, but while working in University of Kazan he developed interest in Psychology, Philosophy, Methodology and Logic. In this last discipline he made indeed a great contribution. Besides that he also wrote poetry and made many translations to Russian of many different subjects. In 1904 his selected poems were published under the name of *Longing for Eternity*.

The disrupts of the first two decades of the twentieth century affected in several ways Vasilʹev, in particular by taking of the provincial tranquility of earlier Kazan’s day life. On October 22nd, 1914, he began his mandatory service in the army being nominated as a doctor in ‘Kazan military and sanitary circumscription of reserve’. His activity as a doctor during the war disturbed his life forever. His contact with the degrading situation of the Russian army, with the desperate situation of the people that were coming from the front, produced a depressive illness in Vasilʹev, which frequently accompanied him until the end of his life (page 54). As a result of his depression in 1916 he has been admitted to the ‘Dr. S. A. Liozner Psychiatric Hospital’, near Moscow, for the first time. On the 3rd of November in 1917 during those decisive days that have shaken

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\(^1\)author: Valentin Bazhanov, published by Canon, Moscow, 2009.
\(^2\)Eventually also translated as Bajanov and even Baµzanov.
\(^3\)Also translated sometimes as Vasiliev, Vassilieff and even Wassilieff. See http://en.wikipedia.org/wiki/Nicolai_A._Vasiliev

But not only that, in particular, A. Morreti considers that Vasilʹev is also the precursor of NOT (N-Opposition Theory), a new branch of mathematics, similar to, but different from *graph* theory and *knot* theory. See, http://alessiomoretti.perso.sfr.fr/NOTHome.html
the world, he wrote to his wife, Ekaterina Stepanovna Zavialova, to inform her
that, after a very difficult combat, Moscow was taken by the Bolsheviks and
it looked as though peace had come to the city, so, “we can write letters now
(page 45)”.

Concerning Vasil’ev’s Psychology’s courses at University of Kazan, the aca-
demic A. P. N. Luria, once wrote that “in his conferences about Psychology, we
can come across many pages dedicated to the brain and interesting reflections
about the personality, and we must remember that these conferences happened
in the beginning of the last century (page.47).”

In the autumn of 1921 University of Kazan gave to the members of its
academic sta¥ a questionnaire to …ll out. There, people were asked about the
research areas of their interests. Vasil’ev answered the following: 1) Logic; 2)
Psychology; 3) History of Conceptions.

In the beginning of 1922, when Vasil’ev was living again a depressive episode,
he retired from his university job and has been admitted to the Hospital of
Kazan’s University. From time to time when he felt better he usually went to
visit Kazan, but the Hospital became his de¤nitive address until the end of his
life. In 1940, on the 30th of October, N. A. Vasil’ev died.

As to his contributions to the history of Logic, without doubt, his most
important essays are The Imaginary Logic and Logic and Metalogic. The …rst
essay, whose theses have been published in English in the Annals of Interna-
tional Congress of Philosophy, that happened in Naples, in 1924, brought the
proposal to build other logical systems by the suppression of some of the ax-
ions of Aristotelian’s traditional logic. Vasil’ev proposed there the indifferent
judgment, a kind of statement with contradictory predicates (A is B and ~B),
whose contradiction would not disturb the consistency of the new logical sys-
tem, because that contradiction was only internal to the statement, that is,
intrasatemental contradiction and not an interstatemental contradiction.

As Professor Bazhanov remarked, “the distinction between the material as-
pect and the formal aspect presupposes two formulations of the principle of
contradiction. One thing is to consider the question: does the principle of con-
tradiction forbids the simultaneous existence of incompatible predicates?; and
another thing is the question: does this principle determines that one and the
same judgment cannot be simultaneously true or false?.. The …rst postulate is
expendable, as it happens in imaginary logic; the second remains sound to any
one logical system that can be thought. It is a necessary condition for logi-
cal reasoning. Indeed, it puts limit to the cognizant subject: it forbids him to
contradict himself. Vasil’ev named the second postulate the law of absolute dis-
tinction between truth and falsity, or principle of non-autocontradiction. The
principle of contradiction, in its material aspect, doesn’t concern the subject,
but the world, and the principle prohibits the contradiction in the exterior world.
We must remark that the belief in impossibility of contradictions in the objec-
tive reality is one of the starting points of Vasil’ev’s logical program, which he
has frequently supported”.

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Bazhanov continued his writings saying that “Vasil’ev considered the *principle of contradiction* to have real and empirical properties[^4]. ‘Empirical’ means that the principle of contradiction reflects the existence of incompatible predicates and properties in our world; it condenses our daily experience in itself, it is an abbreviated formula of human practice, from which it is known that the color red and the color blue are incompatible (the color red is not the color blue), as like noise and silence. The principle of contradiction is real because it reflects the state of things in our objective world. It means that this law is based on the presupposition of its material nature, which is strictly bound to the empirical status of the negation.”

“Simultaneously, the formal principles of thought, as commands the principle of non-contradiction, are sound only in the sphere of the thought, since they are concerned only with judgments and concepts. Another formal principle of thought is the law of sufficient reason (every judgment must have its reason). We must not confuse it with the principle of causality (every phenomenon must have a cause). The following analogy seems admissible: the principle of contradiction is related to the formal law of non-autocontradiction, exactly as the principle of causality is related to the law of sufficient reason.”

As it is known, for the foundation of his logical program, Vasil’ev was inspired by the program of Lobachevskian’s geometry. About this theme, Bazhanov wrote in Chapter 9 of his book (p.152) that according to Vasil’ev: “The possibility of another kind of geometry persuades us of the possibility of one logic different from Aristotelian logic.”[^5]

Bazhanov continues his discourse saying that the fact concerning the possibility of other geometries besides inspiring Vasil’ev giving him impulse for his project also gave him something more:

“The imaginary logic is built by the method of imaginary geometry... to reach my goal, I had to study non-Euclidian geometries... among all systems of non-Euclidian geometries, I dedicated special attention to Lobachevskian’s geometry on which I devoted my time, going through his works.”[^6]

Brazilian logicians have special eminence in Bazhanov’s book. This is so, perhaps because Bazhanov likes a statement of Ayda I. Arruda[^7], qualifying Vasil’ev instead of Lukasiewicz as the precursor of *Paraconsistent Logic*. Lukasiewicz should only be considered as the one who inspired the non-classical logics as a whole.[^8]

Bazhanov recalls that we could also consider Vasil’ev (as proposed by V. A. Smirnov), as the creator of a particular class of logic, the *Multidimensional Logic*. In this special class of logic, each judgment according to its quality corresponds to one dimension. Indeed, in the first presentation of his imaginary logic, Vasil’ev exhibited three kinds of judgment’s dimensions (affirmation, negation and the indifferent judgment).

Vasil’ev established very clearly that we can give gradations for judgments, making then possible the construction of different logical systems, such that distinct logical systems would correspond different gradations of judgments. For example, he said that, for one logical system of *n*-dimensions, the principle of 

\[(n + 1)\]  

is always sound\(^9\).

I end this brief review observing that the above question and its consequences for which concerns the criticism on the principle of excluded middle for intuitionism does not receive the attention it deserves in *Imaginary Logic* and also in Vasil’ev’s essay *Logic and Metalogic*, where the logician of Kazan, inspired by Hilbert’s distinction between mathematics and metamathematics, proposes, for the first time, a clear distinction between logic and metalogic, a distinction, that as it is today well known, is crucial for the study of logical languages and the understanding of their relations.\(^{10}\)

\(^9\)That means that for one logical system consisting of three dimensions, the principle of “quartum non datur” is sound, for one logical system of four dimensions, the principle of “quintum non datur” is sound, etc.

\(^{10}\)For those readers eventually interested in a contemporary presentation of Vasil’ev imaginary logic we suggest (besides Arruda essay already quoted) the paper: G. Priest, Vasil’ev and Imaginary Logic, *History and Philosophy of Logic* 21(2), 135-146 2000. See: http://dx.doi.org/10.1080/014450050064031