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Book Reviews

VALENTIN A. BAZHANOV, **N. A. Vasil'ev and his Imaginary Logic**, Kanon+, Reabilitatsiia, Moscow, 2009, 240 pp., ISBN 9785883731968.

In a book that appeared in 2009 in Russia, Valentin Bazhanov[1] presents a biography of Nicolai A. Vasil'ev[2] (1880–1940), who was a professor at the University of Kazan in the early twentieth century. Vasil'ev invented a logical system that he called imaginary logic which anticipated some of the more fertile lines of contemporary logic.[3]

Bazhanov brings to light many facts concerning the personal and intellectual life of Vasil'ev which had, unfortunately, remained obscure until recent times. This brilliant professor provided many proofs of his multifarious talents during his life. He was a medical doctor, but while working at the University of Kazan he developed an interest in psychology, philosophy, methodology and logic, making his greatest contribution to the last of these. In addition, he wrote poetry and made many translations into Russian of works on many different subjects. In 1904, his selected poems were published under the title of *Longing for Eternity*.

The disruptions of the first two decades of the twentieth century deeply affected Vasil'ev in several ways, banishing the provincial tranquility of his earlier days in Kazan. On October 22nd, 1914, he began his mandatory service in the army, being appointed as a doctor in the Kazan military and sanitary reserve corps. His activities as a wartime doctor perturbed his life henceforth. His experience with the decimation of the

[1] Sometimes also translated as Bajanov and even Bažanov.

[2] Sometimes also transliterated as Vasiliev, Vassilieff, and even Wassilieff. See http://en.wikipedia.org/wiki/Nicolai_A.~Vasiliev.

[3] But not only this. In particular, A. Morreti considers that Vasil'ev 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.

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Russian army and the desperate situation of the people who were fleeing from the front produced a depressive illness that plagued him until the end of his life (page 54). As a result of his depression, he was admitted in 1916 to the Dr. S. A. Liozner Psychiatric Hospital near Moscow. On the 3rd of November 1917, during those decisive days that shook the world, he wrote to his wife, Ekatierina Stepanovna Zavialova, to inform her that after hard combat, Moscow had been taken by the Bolsheviks, and that it looked as though peace had come to the city, so "we can write letters now (page 45)."

Regarding Vasil'ev's psychology courses at the University of Kazan, A. P. N. Luria wrote that

> in his lectures on psychology, we come across many pages dedicated to the brain and interesting reflections on the personality; and we must bear in mind that these conferences occurred at the beginning of the last century. (p. 47)

In the autumn of 1921, the University of Kazan gave the members of its academic staff a questionnaire to fill out on their research interests. Vasil'ev responded as follows: (1) Logic; (2) Psychology; (3) History of Ideas.

In early 1922, when Vasil'ev was facing a bout of depression, he retired from his university job and was admitted to the University of Kazan hospital. From time to time, when he felt better, he would go to visit Kazan; but the Hospital became his definitive address until the end of his life. In 1940, on the 30th of October, Vasil'ev died.

As to his contributions to the history of logic, his most important essays are undoubtedly *The Imaginary Logic* [5] and *Logic and Metalogic* [7]. The first essay, which was published in English in the *Annals of the International Congress of Philosophy* held in Naples in 1924, presented a proposal to construct other logical systems, suppressing some of the axioms of traditional Aristotelian logic. Vasil'ev proposed the indifferent judgment, a kind of statement with contradictory predicates (A is B and $\sim B$), whose inherent contradiction would not disturb the consistency of the new logical system because the contradiction was only internal to the statement, i.e. an *intrastatemental* contradiction and not an *interstatemental* contradiction.

As Professor Bazhanov remarked:

> the distinction between the material aspect and the formal aspect presupposes two formulations of the principle of contradiction. It's one

> thing to consider the question, does the principle of contradiction forbid the simultaneous existence of incompatible predicates, and quite another to ask, does this principle determine that one and the same judgment cannot be simultaneously true and false? The first postulate is expendable, in that it occurs in imaginary logic; the second remains sound in any conceivable logical system. It is a necessary condition for logical reasoning. Indeed, it places a limit on the knowing subject, forbidding him to contradict himself. Vasil'ev named the second postulate the law of absolute distinction between truth and falsity, or the principle of non-autocontradiction. The principle of contradiction, in its material aspect, doesn't concern the subject, but rather the world, prohibiting contradiction in the outside world. We cannot fail to observe that the belief in the impossibility of contradictions in objective reality is one of the starting points of Vasil'ev's logical program which he frequently stressed. (p. 140)

Bazhanov continues, 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 and 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), and likewise 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 assumption of its material nature, which is strictly tied to the empirical status of the negation. (p. 140)

> Simultaneously, the formal principles of thought, as mandated by 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. (p. 141)

[4] [5, p. 220].

As is well known, in the establishment of his logical program Vasil'ev was inspired by the approach of Lobachevskian geometry. 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 a logic different from Aristotelian logic.[5]

Bazhanov goes on with his argument, stating that the possibility of other geometries, besides inspiring Vasil'ev by to pursue his project, also gave him something more:

> The imaginary logic is constructed employing 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 geometry, to which I devoted my time, going through Lobachevsky's works. [6, pp. 21–22]

Brazilian logicians have special eminence in Bazhanov's book. This is so, perhaps because Bazhanov likes the claim made by Ayda I. Arruda [1] that Vasil'ev instead of Łukasiewicz should be identified as the precursor of *paraconsistent logic*. Łukasiewicz should rather be regarded only as the one who inspired the non-classical logics as a whole.[6]

Bazhanov points out that we could also (as proposed by V. A. Smirnov) regard Vasil'ev as the creator of a particular type of logic: *multidimensional logic*. In this special type of logic, each judgment, according to its nature, corresponds to one dimension. Indeed, in the first presentation of his imaginary logic, Vasil'ev exhibited three kinds of dimensions of judgment (affirmation, negation and the indifferent judgment).

Vasil'ev established very clearly that we can give gradations to judgments, thus making possible the construction of different logical systems, such that distinct logical systems would correspond to different gradations of judgments. For example, he said that for a logical system of n dimensions, the principle of $(n + 1)$ excluded is always sound.

I conclude this brief review whith the observation that the question on the principle of (n+1) excluded, which has consequences for the criticism of the principle if excluded third by intuicionism does not receive the due attention in Bazhanov's book, if we consider the attention, which it

[5] This is a disputable issue, as has been discussed by Charles Duffy [4], in view of a previous Bazhanov book [2].

[6] Of course, there are some strong claims against the views of Arruda and Bazhanov, e.g. [3].

deserved in Vasil'ev's essay *Imaginary Logic*. The same we can say about the Vasil'ev 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 well-known distinction today which is crucial for the study of logical languages and the understanding of their relationships.

References

[1] Arruda, A. I., "A survey of paraconsistent logic", in *Mathematical Logic in Latin America*, A. I. Arruda, R. Chauaqui and N. C. A. da Costa (eds.), North-Holland, Amsterdam, 1980.

[2] Bazhanov, V. A., *Nicolas Alexandrovich Vasiliev (1880–1940)*, Nauka, Moscow, 1988 (in Russian).

[3] Cavaleire, F., "Review-essay of N. A. Vasil'ev, *Imaginary logic* (Russian), edited by V. A. Smirnov", *Modern Logic* 2, 1 (1991): 52–76. In Italian. http://projecteuclid.org/DPubS?service=UI&version=1.0&verb=Display&handle=euclid.rml/1204834791

[4] Duffy, Ch., "Review of B. A. Bazhanov, *Nikolai Aleksandrovich Vasil'ev*", *Modern Logic* 1, 1 (1990): 71–82. http://projecteuclid.org/DPubS?service=UI&version=1.0&verb=Display&handle=euclid.rml/1204834541

[5] Vasil'ev, N. A., *The Imaginary Logic*, Kazan, 1912 (in Russian).

[6] Vasil'ev, N. A., *Report on Teaching*, 1912.

[7] Vasil'ev, N. A., *Logos*, No 1–2, 1912–1913 (in Russian).

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