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and Philosophy of Science

Vladimir Markin

Dmitry Zaitsev *Editors*

The Logical Legacy of Nikolai Vasiliev and Modern Logic



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Editors

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Preface

This volume grew out of the international workshop “Nikolai Vasiliev’s Logical Legacy and the Modern Logic” (Moscow, Russia, October 2013) co-hosted by the Department of Logic of the Faculty of Philosophy, Lomonosov Moscow State University, and the Institute of Logic, Cognitive Sciences and Development of Personality. The workshop focused on the impact of Nikolai Vasiliev, the outstanding Russian logician and philosopher, on modern logic and marked the centenary of his famous paper “Imaginary (Non-Aristotelian) Logic” (1912).

Nikolai Aleksandrovich Vasiliev (1880–1940), professor of Kazan University (Russia), was a seminal thinker, philosopher, rhyme maker, and logician, who outpaced his time and influenced the development of logical ideas far outside his own country (time and place). He is widely acknowledged for having pioneered logic with a consistent logical system in the form of syllogistics theory basing upon a contradictory ontology, thus having emerged as the father of paraconsistent logic. What is more, though short (four papers published in 1910–1913), his scientific legacy underpins fruitful ideas of modern logic. Some researchers also trace in his writings elements of the many-valued and modal logic as well. All of the above compels one to regard Nikolai Vasiliev along with Jan Łukasiewicz as one of the precursors of nonclassical logic.

It is his imaginary (non-Aristotelian) logic that attracts the most interest of modern researches. Since the seminal V.A. Smirnov’s paper and D. Comey’s review on it in the *Journal of Symbolic Logic*, there have been a lot of attempts to present formally imaginary logic. A. Arruda proposed a number of propositional calculuses of paraconsistent type whose language contains atomic formulas expressing contradictory statements. Though none of these systems cannot be considered as an adequate formalization of Vasiliev’s logic (because his original imaginary logic was constructed as a syllogistic type), they represent an initiatory step on the road to further development of Vasiliev’s ideas in modern symbolic logic. The task to formally reconstruct Vasiliev’s original syllogistic logic was set by Soviet logician V. A. Smirnov who started the work analogous to that executed by Łukasiewicz w.r.t. Aristotelian syllogistics. He proposed topological interpretation of propositions in imaginary logic. In so doing he formulated a translation of imaginary logic into first-

order language enriched with operators of closure, interior, and complementation and proposed a possible axiomatization of resulting theory as a syllogistic theory of a special kind built over a predicate calculus. This work was resumed by V. Markin, T. Kostyuk, and D. Zaitsev. They considered all the variants of imaginary logic (the main version, investigated by Vasiliev in detail, and three “interpretations” of imaginary logic with different sets of laws) and provided adequate axiomatizations for them. It was evident that Vasiliev was not only one of the first to propose a logical alternative to classical ones but that he also pointed out a manifold of nonclassical logical systems, formulated in the same formal language but with different sets of laws. It is his doubtless unrecognized merit.

The logical legacy of Nikolai Vasiliev can serve as a promising source for developing an impressive range of philosophical interpretations, as it marries promising technical innovations with challenging philosophical insights. Equally important is the fact that the novelty of his logical project has opened up prospects for modern logic as well as for nonclassical science in general. Thus, a volume containing a selection of papers written by prominent modern specialists in the field dealing with various aspects of Vasiliev’s logical ideas is presented.

The editors take this occasion to acknowledge with gratitude the support of Professor and Chair Otávio Bueno of the Department of Philosophy at the University of Miami who is also the editor in chief of *Synthese*.

Moscow, Russia
Moscow, Russia

Dmitry Zaitsev
Vladimir Markin

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Chapter 1

Nikolai A. Vasiliev, His Life and Imaginary Logic Legacy

Valentin A. Bazhanov

Abstract The paper deals with intellectual legacy of Kazan University professor N.A. Vasiliev (June 29, 1880–December 31, 1940), the forerunner of modern non-classical logic. A thinker with a wide range of interests, he worked in poetry, philosophy, ethics, psychology, and history. N.A. Vasiliev’s path to imaginary logic is presented, along with the revival of his ideas in the early 1960s and their contemporary development.

Keywords Imaginary logic • Non-classical logic • Paraconsistent logic • Metalogic

At the beginning of the twentieth century, Kazan University professor of philosophy Nikolai Vasiliev (June 29, 1880–December 31, 1940) created a novel logical system that broke radically away from Aristotle’s thousand-year tradition of classical logic.

In his youth, N.A. Vasiliev was fond of poetry. As if anticipating the fate of his own ideas, he once wrote:

*We are a quickly dying flame.
And again a burning fire.*

Indeed, Vasiliev’s groundbreaking work in logic from 1910 to 1913 established him as a thinker and anticipated the development of many branches of modern non-classical logic (see: Arruda 1977, 1980).

Vasiliev’s accomplishments in logic parallel those of Lobachevsky in geometry. Lobachevsky’s ideas laid the foundation for non-Euclidean—and in that respect “non-classical”—geometry. Lobachevsky’s approach to geometry was called “imaginary”; Vasiliev’s considered his approach to logic also “imaginary.” Lobachevsky opened new horizons for the development of mathematics, as Vasiliev did for formal logic.

Despite Vasiliev’s half century of interesting work in psychology, ethics, philosophy of history, literary criticism, and Russian Symbolist poetry, his work went

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unnoticed, and no one was interested in learning his personal history. I discovered an archive of Vasiliev's works (including handwritten ones), which led to the publishing of selected works and a biography of N.A. Vasiliev (1989; Bazhanov 1988, 2009).

1.1 Heir of Intellectual Traditions

N.A. Vasiliev descended from a family that left deep marks in the history of the Russian state. He particularly noted the "mental atmosphere" that prevailed in his family.

Vasiliev's paternal grandfather, Vasily P. Vasiliev (1818–1900), was a well-known Russian sinologist and academician of the Petersburg Academy of Sciences. He married the daughter of I.M. Simonov (1794–1855), Rector of Kazan University, astronomer, and a member of the first expedition to Antarctica. He was also a navigator on the sloop, "Diana," when in 1807 it was sent "for discovery and inventories in the northern part of the Pacific Ocean." One of Vasiliev's paternal uncles, Nicholai (1857–1920), was a prominent Social Democrat and closest ally of G.V. Plekhanov. Vasiliev's father, Alexander (1853–1929), achieved notoriety in the fields of mathematics, sociology and politics. He was a member of the First State Duma, of the State Council, and of the Central Committee of the Constitutional Democratic party.

Vasiliev's maternal grandfather, Pavel P. Maksimovich (1817–1892), was a prominent figure in public education in Tver province who organized Zemsky schools. He established a school where females learned to be teachers, later named after him. One of Vasiliev's maternal uncles, Vladimir (1850–1889), was a talented mathematician.

The Vasiliev estate, Kainki, located where the Sviyaga flows into the Volga, hosted many of Russia's well-known political and cultural figures, including Alexander F. Kerensky, who fell in love with a close relative of Vasiliev's family, Olga L. Baranovsky. The wedding between A. F. Kerensky and O. Baranovsky took place at Holy Cross Church in Kainki. Later, their sons, Oleg and Gleb, would spend summer holidays at Kainki (Bazhanov, 2006).

Vasiliev's maternal grandmother, Anna A. Khlebnikova, descended from a family whose Russian roots go back centuries. In 1545 Baron von Uexküll immigrated Prussia (Livonia) to serve the Russian tsar, adopting his baptismal name, Fedor. Fedor's son, regimental commander Alexei Sokovnin, was executed in 1697 for plotting against Peter I together with F. Pushkin, the ancestor of the great Russian poet, Alexander S. Pushkin, who wrote about the incident in "Bloodline." Sokovnin's sisters, Evdokia (Princess Urusova) and Theodosia (noblewoman Morozova), were known for their stubborn opposition to the ecclesiastical innovations in the days of Patriarch Nikon. Khlebnikov's daughter became the wife of Pavel P. Maksimovich. Together they had a daughter, Alexandra, who was Vasiliev's mother Vasiliev.

On June 29, 1880 in Kazan, Alexandra Pavlovna Maksimovich's and Alexander V. Vasiliev's first child, Nicholai, was born. The boy had a remarkable memory and sharp mind.

In his diary, Vasiliev recalled that he was growing up a "whimsical, capricious and even spleeny child," and wrote: "Due to the seriousness of the books I was reading, and in general the mental atmosphere that surrounded me, I was evolving intellectually" [Vasiliev (*Youth diary*), 1]. In adolescence Nikolai engaged seriously in psychology and logic (going so far as to outline a very complicated work by Charles Peirce on the logic of relations), and reflect on the ethical issues raised by L.N. Tolstoy and Vladimir S. Solov'yov.

Vasiliev was aware that the study of psychology required knowledge of the biological and medical sciences. Thus, in 1898 he matriculated in the Department of Medicine of Kazan University and in 1904 obtained a diploma in Medicine "with distinction." After working as a physician for a short period, Vasiliev decided to dedicate himself to psychology, logic, and philosophy. In 1906 he graduated from Kazan University's Historico-Philological Department and stayed on at the University to prepare for a professorship at the Department of Philosophy. During this same time, he taught philosophy and psychology at the Kazan Institute for Women. In 1908 Vasiliev determined that psychology is nothing more than a preparatory phase of intellectual development whose next step is the study of philosophy and logic, and later the same year transferred his interests fully to these fields of study.

On May 18, 1910, Vasiliev delivered a lecture entitled, "On partial judgments, on the triangle of opposites, and the law of the excluded fourth" at Kazan Federal University as a test to determine his readiness to join the roster of University lecturers. In this lecture, Vasiliev for the first time proposed the idea of non-Aristotelian, imaginary logic (although the term "imaginary logic" did not come until nearly a year later). The text of this lecture was published in October of the same year, marking the birth of his novel logic. On January 13, 1911, Vasiliev gave a presentation entitled, "Non-Euclidean geometry and non-Aristotelian Logic," at the 150th meeting of the Kazan Physico-Mathematical Society. This meeting attracted an unusually large number of participants and triggered a lively discussion. In April of 1911, Vasiliev delivered a speech at the Moscow Psychological Society on "The duality of logic."

It should be noted that around the turn of the twentieth century (before the 1917 October upheaval), the Department of Philosophy at Kazan University included well-known scholars (E.A. Bobrov, A.I. Smirnov, I.I. Yagodinsky, V.N. Ivanovsky, A.O. Makovelsky, A.D. Gulyaev).

In the summer of 1911, Vasiliev was sent abroad by the Ministry of Higher Education to study at the libraries of Germany, France, and England in preparation of a fundamental work on imaginary logic.

In the autumn of 1914, Vasiliev was drafted into military service and took part in World War I battles. Painful impressions of the war sent Vasiliev into a deep depression. In December of 1916, Vasiliev was dismissed from the service due to the illness.

He returned to Kazan and continued teaching at the University. Due to a Resolution of the Council of the University in December of 1917, Vasiliev was appointed associate professor in the Department of Philosophy, and on October 1, 1917, by Decree of the Council of the People's Commissars, he was named full professor. Nevertheless, by only 1922, he—at the age of 42—would have to retire as an “old style, bourgeois” professor (as new communist government called University lecturers). Vasiliev continued to work on constructing a special “logic of content,” but the mental illness that had first appeared during his military service was resurfacing. “How do I want to live? My interest in the history of our time is enormous. I deeply believe in my ideas and their fundamental importance,” declared Vasiliev in the early 1930s.

Vasiliev, so to speak, was “lucky”: due to the fact that he had been a patient in a psychiatric hospital, he avoided the Stalinist purges. On the last day of 1940, Vasiliev has passed away.

1.2 “The Longing for Eternity”: N.A. Vasiliev as a Writer and Poet

Throughout his life N.A. Vasiliev was engaged in literary work as a poet, critic, and translator, but after 1908 his literary interests took a back seat to his scientific research.

Vasiliev's literary heritage is extensive. It includes a collection of philosophic lyrical poems entitled *Longing for Eternity* (1904), a translation of Belgian poet E. Verhaeren's famous *Mad Villages*, and translations of poems by A. Swinburne. Vasiliev wrote articles critiquing these poets, which, as a rule, accompanied his translations and showed how thoughtfully he had done this critique and translation work.

In his poetry Vasiliev depicted a world with properties fundamentally different from those of our own, creating an imaginary, fantastic world in which one and the same object would coincide grounds for positive and negative judgments.

There is another world, the world of the carefree,
 Where things form a unity without end,
 Where each atom,
 Only a tiny part of one long ranged ring.
 A wolf rests there with cattle,
 With an innocent victim of the executioner,
 There's laughter mingled with tears,
 The sorrowful weeping subsided.
 (Vasiliev 1904, 138)

The style of the poetry of the young Vasiliev convinces us that he belonged to the Symbolist movement, which played an important role in the cultural life of

Russia in the early twentieth century. It was usual for Symbolists to reason about the coexistence of other worlds, but in Vasiliev's poetry this idea reached particular significance. The Symbolist themes of other worlds –found new life in the poet who used the language of logic to describe imaginary worlds and strive to provide their structures.

Vasiliev's poetry was philosophical in essence, but he was interested in not only philosophical lyrics. He was one of the first Russian translators of E. Verhaeren, motivated to show that “at this time of intense struggle, when we constantly have to think over the social issues, the sociological poetry of Verhaeren will not be alienated to Russian readers.” Verhaeren's poetry, Vasiliev claimed, was “highly anthropocentric ... All his interests are close to the nature of man. Man is Verhaeren's Sun ...” (Vasiliev 1907, 84). Pondering over Verhaeren in the beginning of the twentieth century, Vasiliev developed the concept of the “high cosmic destiny of man.”

This same concept is what attracted Vasiliev to A. Swinburne, as well as a critical analysis of N.V. Gogol works, and controversy over L.N. Tolstoy and V.S. Solov'yov.

“Longing for Eternity” already contains the ideas that represented, in poetic form, the concept of imaginary logic.

1.3 At the Threshold of an Imaginary Logic

The analogy with non-Euclidean geometry leads to the idea that non-Aristotelian logic is possible. If there is a geometry of curved space, why can't there be a special kind of 'curved' logic, Vasiliev pondered in the early twentieth century. “The world has seen many new inventions. We can talk over the telephone at almost unlimited distances, and some of our contemporaries fly like birds through the air. Radium has been discovered, which is often assumed, with a certain show of plausibility, to upset the laws of physics; but the invention of non-Aristotelian logic would cap the climax” (Carus 1910, 77–78). The intellectual milieu of that time considered achievements in the field of the mind to be higher than those in the fields of engineering and technology.

However, the counters of such logic were vague and scholars admitted only the fact of its existence. Although there were high scientific hopes for its creation, the path to its discovery was bumpy.

1.4 “I Risk . . . Falling Under the Charge of Logical Heresy”

Vasiliev, in his work, “The Impact of Darwin's Ideas Upon the Philosophy,” supports the opinion of well-known German logician Ch. Sigwart that Darwin's theory revolutionized the field of logic as well. Darwin's theory of evolution

among the physical characteristics of all living creatures led Vasiliev to realize a similar evolution of concepts. Aristotelian logic presupposed the invariability of concepts. Vasiliev's view was that this belief was shattered by Darwin's theory. The discontinuity of concepts, claimed Ch. Sigwart, had been covered up by a picture of their continuity, and it would be impossible to determine how logic would respond to this revolution. However, one fact was certain: it would require fundamental changes in the study of logic.

Vasiliev, quoting Sigwart, wrote about upcoming drastic changes in logic with enthusiasm, although perhaps he could not even imagine these writings would become the source for these drastic changes.

Vasiliev began the presentation of his concept by stating that already in the logic of the nineteenth century, there had begun a determined opposition to traditional classification by quality of judgments into the general, particular and singular. All attempts to improve this classification resulted only in giving it a new form. The stumbling block of classification, according to Vasiliev, lies at the interpretation of particular judgments. A scientist claims that particular judgments regarding concepts ("Rules") are general, but judgments regarding things are subject to the traditional classification. Judgments regarding concepts and judgments regarding things would therefore require different logics.

In the judgments regarding things, the law of the excluded middle—one of the basic laws of Aristotelian logic—remains valid, while the judgments regarding concepts requires the law of the excluded fourth. Therefore, the "law of the excluded middle must be completely removed from the canons of the laws of thought . . ." stressed Vasiliev. "Of course, I run the risk of falling under the charge of logical heresy, or even something worse, which of course is frightening for everyone, but especially for a beginner, but my logical conscience does not allow me to put up with this 'law of thought'" (Vasiliev 1910, 41).

The Review of the Kazan Physico-Mathematical Society meeting was published in the "local newspaper *Kama-Volga*". Vasiliev's presentation was seen as strongly reminiscent of the situation in which Lobachevsky discovered non-Euclidean geometry. Lobachevsky abandoned the famous fifth postulate and built geometry without this postulate. Vasiliev constructed a new kind of logic similarly by waiving one of the basic laws of Aristotelian logic—the law of (non)contradiction. Discussions following Vasiliev's admitted that he was the author of true "logical invention."

In his subsequent works, "Imaginary (non-Aristotelin) logic" (Vasiliev 1912a) and "Logic and Metalogic" (Vasiliev 1912c–1913), he gives the most complete picture of the new logic. He insists that the new logic adhere to the principle of relativity, "the basic principle of modern times . . . The belief that all thinking creatures are limited by the logic of Aristotle seems false to me" (Vasiliev (report) 1912b, 25).

Vasiliev emphasized the heuristic parallels between imaginary logic and non-Euclidean geometry. He even declared that imaginary logic constructed had been by the same method used for constructing imaginary geometry.

Following Vasiliev's conscription into the army, when his research in logic was interrupted, and his return to Kazan in 1916, he was no longer able to proceed with the same level of activity as before. However, in 1924 he did deliver an abstract entitled, "Imaginary (non-Aristotelian) logic," to the Fifth International Congress of Philosophy in Naples (Vasiliev 1925). This was his only one foreign language scientific publication.

1.5 Life After Death: The Fate of Vasiliev Logical Ideas

The long oblivion to which Vasiliev's ideas have been relegated makes especially valuable the review of his works in logic by the outstanding Russian/Soviet mathematician and one of the founders of the Moscow School of Mathematics, N.N. Luzin. Writing in 1927, Luzin stated: "[W]orks of N.A. Vasiliev on logic are of great importance in regard to the study of the principles of thought in general . . . the ideas of N.A. Vasiliev received the highest importance because of new trends in mathematics (Luzin means intuitionism and effectivism, he followed, close to intuitionism by main principles—*VB*). Vasiliev's ideas coincide surprisingly with the latest efforts to which mathematicians are forced now to resort" (see Vasiliev 1989, 184–185).

As Vasiliev's imaginary logic was too advanced for his time, its conceptual wealth has been revealed gradually. The first idea to attract attention was the idea to expand the number of truth values. "Some sections of modern algebra—wrote prominent Soviet algebraist Anatoly I. Mal'tsev—are dedicated to the study of algebraic structures arising in mathematical logic. Work of this kind in Russia began in Kazan Federal University . . . Here Platon S. Poretsky delivered in 1887–1888 the country's first major presentation in mathematical logic . . . [A]fter the death of Poretsky, Kazan Federal University again became the birthplace of a bright new idea—the idea of multi-valued logic put forward by N. Vasiliev . . ." (Mal'tsev 1976, 473).

"Perhaps with much stronger reasons than for the case of many-valued logic . . . N.A. Vasiliev may be considered as a forerunner of non-classical logics constructed for the study of inconsistent non-trivial theories," stressed Aida I. Arruda, a prominent Latin American logician (Arruda 1977, 4). She meant that paraconsistent logics had significantly weakened the connection between truth and provability, and that they were suited to deal with contradictory situations.

V.A. Smirnov put forward an idea that Vasiliev is a precursor of a very special class of logic, the so-called "multi-dimensional logics" (Smirnov 1993).

The prediction by Vasiliev of a plurality of logical systems has long been realized. In an effort to look into the future, he claimed: "We have to enter into the logic the idea of infinity, the great idea of modern times . . . It is necessary to demonstrate the infinity of possible logical systems. Someone who will make sure of this will feel a sense of Giordano Bruno when in his imagination appeared the infinity of the physical universe . . . All the modern movement in logic is rebellion against Aristotle

... it is difficult to predict the future. We can only reiterate the words spoken to Louis XVI, that future generations will decide whether it is the revolt against Aristotle or a true scientific revolution” (Vasiliev 1912c–1913, 80–81). The future has firmly proved that this movement was the scientific revolution.

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Chapter 2

N.A. Vasiliev in the Context of Philosophical and Methodological Disputes of the Early Twentieth Century

G. V. Sorina

Abstract One of the key objectives of this article is, on the one hand, to present the general context of the philosophical and methodological disputes of the early twentieth century, both in the Western countries and in Russia, using examples of disputes in the framework of the ‘psychologism-antipsychologism’ antithesis. At the same time, the discussion between psychologism and antipsychologism is considered as a manifestation of the idea of unity – despite the differences and certain forms of individualisation – between the spiritual cultures of Russia and the West. This consideration is instrumental in showing that N.A. Vasiliev was included into the general context of the philosophical and methodological disputes of his era; and that in this context he takes a metaposition through rejecting the views of the advocates of both poles of the antithesis. The article describes his position as that of anti-antipsychologism. The double “anti-anti” negation is not equal to the statement of the initial position, in this case, psychologism. The relevance of this study lies in the fact that the beginning of the twenty-first century has seen a rise in the interest in the problems of psychologism in logic, philosophy, and culture in general.

Keywords Logic • Psychology • Philosophy • Methodology • Imaginary logic • Psychologism • Antipsychologism • Anti-antipsychologism

The turn of the twentieth century saw numerous discussions in the field of philosophy and methodology of science. At the same time, the dispute between the adherents of the “psychologism-antipsychologism” antithesis can be rightfully called the keystone of all philosophical and methodological disputes of the early twentieth century. In developing argumentation in support of one of the poles of the antithesis, this dispute, which emerged in the framework of logic, uses arguments not only from the field of theoretical logic, but also those from philosophy and methodology. The scope of this dispute is so wide that it penetrates other fields of

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culture, including linguistics, literary studies, political economics, and semiotics. This list can be further expanded. In effect, it is the manifestations of this dispute in other cultural spheres that makes it the logical and cultural fundamental (LCF) of the era (for more detail see (Sorina 2013)).

The idea about the significance of this dispute for philosophy was eloquently expressed by the Russian philosopher B.V. Yakovenko in his work “On the modern condition of German philosophy” published in the *Logos* journal in 1910. He writes that it is the problem of psychologism that manifests the unity and coherence between the logical and cognitive theoretical interests of modern German philosophy, and that the predominance of such theoretical interests is observed not only in works on logic and epistemology, but also in most philosophical works. Yakovenko believes that the further development of philosophical thought is impossible without abandoning the “psychological dogmatics”, without the formulation of the attitude of philosophy towards psychology. In this concise text, Yakovenko presents the key ideas of the evolutionary development of the psychologism problem, both in E. Husserl’s philosophy and as seen by A. Meinong, W. Dilthey, P. Natorp, H. Rickert, H. Cohen, and other thinkers (Yakovenko 1998).

What is meant by the concepts of “psychologism” and “antipsychologism”? The actual notion of “psychologism” is used as a common name for the philosophical and methodological trend, which can be *unambiguously* identified in the history of development of *logic, philosophy, and intellectual culture* not only in the early twentieth but also in the preceding years of the nineteenth century.

Moreover, a critical reconstruction of this dispute makes it possible to argue that the main ideas of the dispute between psychologism and antipsychologism – without the use of corresponding terminology – can be observed throughout the last four centuries in the history of logic and philosophy, starting with the philosophical preoccupations of J. Locke and R. Descartes. The cycles of ups and downs in disputes pertaining to the ideas of psychologism, including the modern ones, generate particular “worlds” of psychologism and antipsychologism within culture. The notions of “psychologism” and “antipsychologism”, which represent those worlds, prove to be fuzzy sets, of somewhat open systems that still accumulate their elements.

The complications, that any attempts at giving a precise definition of psychologism are fraught with, relate, in particular to the fact that the content of the concept of “psychologism” proves to be:

- dependent on numerous characteristics belonging to different philosophical and methodological principles and approaches, in particular, anthropologism, relativism, scepticism, and others.
- carrying numerous negative connotations in philosophical literature.

Few authors tend to characterise their theories as relating to psychologism, or themselves as advocates thereof. At the same time, many philosophers are eager to define other theories as such. As Franz Brentano emphasises, the reaction of a “pious philosopher” to the word Psychologism is not unlike that of an orthodox Catholic to the term Modernism: he crosses himself as though the devil himself

were in it. Simply speaking, psychologism is something philosophers are accused of and the non-involvement with which they aspire to prove (Brentano 1973). The negative connotations of a certain term are not easily eliminated. All of it indicates that there is a need for a critical methodological analysis of the essence of either the terminology itself or the position behind this terminology. As it is shown below, N.A. Vasiliev chooses the path of critical analysis of argumentation of the adherents of both psychologism and antipsychologism.

In its turn, my own critical methodological analysis of texts stemming from different fields of science and culture made it possible to indentify 24 variants of the definition of psychologism and 22 of antipsychologism. At the same time, the analysis showed that, despite the differences in interpreting psychologism, one can identify *commonalities that connect a theory with psychologism* in various fields of science and culture. There are three basic features. First of all, it is the statement of the methodological and theoretical predominance of psychology over all other sciences; secondly, it is the declaration of the need to build other sciences on the foundation of psychology; thirdly, it is providing the subject with the decisive role in science and culture. The attitude towards the subject, the identification of its role in the process studied by individual sciences and different domains of culture, the emphasis on the decisive role of the subject or the complete denial of their significance in each concrete sphere is the demarcation line between psychologism and antipsychologism.

In its turn, *the antipsychologism movement* was aimed against the “axioms of psychologism”. The key characteristics of antipsychologism in the complex of humanities can be presented as follows. The content of no science, including psychology can be explained and justified in psychological terms. It is independent of psychological processes. Any science should aspire to study its own forms that determine its subject matter. In science, it is not only inadmissible to reduce everything to the mental processes of the cognising individual (as the subject of cognition), but the subject should be taken beyond the framework of science. For instance, it is the perspective of the classical antipsychologism developed by G. Frege, who aspired to place the subject beyond logic and epistemology. It suggests that the “machine of science” produces results without human intervention. The human being just has to be familiar with the method for using this machine. For example, for *Wittgenstein of the Tractatus Logico-Philosophicus period*, the essence of antipsychologism was expressed in several theses. Firstly, in the statement that “logic is prior to any experience” (5.552); secondly, in the principle of “isolating the subject, or rather of showing that in an important sense there is no subject” (5.631). The Russian philosopher B.V. Yakovenko argues by analogy. His antipsychologistic epistemology contains a tendency towards the “critical expulsion” of the subject from the content of cognition.

Special attention should be paid to analysing the *origin of the notion of psychologism*. According to Nicola Abbagnano, who traces the usage of the term “psychologism” in the writings of German philosophers of the first half of the nineteenth century, this term was first used to characterise the philosophical movement that was initially supported by J. F. Fries и F. E. Beneke and opposed

to Hegelianism – the then dominant philosophy in Germany. At the time, the first complex of psychologism ideas related to protecting the “rights of experience” and stating that self-observation (or introspection) is the only mechanism of philosophical study to be used by a thinker. The second complex related to characterising the method of establishing the truth as a procedure based on analysing the subjective elements of self-observation. This position suggests that psychology is a fundamental philosophical and scientific discipline, and introspection is a viable psychological method, which makes it possible to obtain valid research results for any theoretical research. Such statements led to the conclusion that science and philosophy can be reduced to introspective psychology (see Abbagnano 1967).

Frege's critique of Husserl's Philosophy of Arithmetic written from a psychological perspective and published in 1894 is somewhat of a watershed in the sluggish dispute between psychologism and antipsychologism. This critique of psychologism was the driving force behind Husserl's *Logical Investigations* and the transformation of the dispute between psychologism and antipsychologism into the central philosophical dispute of the era. And the same critique outlined the ideas that were later called “*psychologism in logic*” and “*antipsychologism in logic*” in philosophical literature. It is the ideas that would be more accurately called – as V.N. Bryushinkin emphasises – the ideas of psychologism and antipsychologism in philosophy of logic. In effect, the problem of “psychologism and antipsychologism in logic” included a discussion about the justification of logic, the identification of its object, and the problem of correlation between logic and thinking. These are problems “relating to the philosophical interpretation of logic” (Bryushinkin 1998).

At the same time, the *philosophical and methodological disputes between psychologism and antipsychologism in the context of logic* became a model for the identification and reconstruction of variants of such disputes within other sciences and fields of knowledge, namely epistemology and metaphysics, history of philosophy, including religious philosophy, linguistics, literary studies, history, sociology, law, theatre studies, and other fields.

The *key premises of logical psychologism* can be presented as follows. Logic is a science of thinking; thinking belongs to the field of psychology, thus, the theoretical foundation of logic lies within psychology and logic itself is aimed at studying scientific knowledge. These ideas were most pronounced in J.S. Mill's philosophy in the English school and in Ch. Sigwart's philosophy in the German one. However, the founding role was played in this process by Mill, who was called by G. Frege the leader of logical psychologism. Mill had a profound influence on representatives of different fields of knowledge: logic, linguistics, literary studies, political economics, sociology, history, and other sciences. In effect, he offered all of them the models of analysing and reasoning methods. It is largely owing to him that the conceptual framework of psychologistic logic spread to different fields of culture and knowledge, which, in its turn, contributed to the development of the “cumulative world of psychologism” and the transformation of psychologism into the logical and cultural fundamental of the era (Sorina 1993).

Antipsychologism in logic has its own distinctive history. *The key premises of logical antipsychologism* are closely related to the objectives of justifying logic

and mathematics. Frege commissions antipsychologism to draw a strict borderline between logic and psychology. Frege believes that the objective of logic is studying the laws of truth rather than thinking. At the same time he clearly formulates the methodological focus of the objectives of logic: logic studies only such truth, whose knowledge is the aim of science (Frege 1987). Frege understands thought as something that has no bearing on psychology and that the notion of truth is applicable to. It leads to the key thesis of Frege's antipsychologism that thought is something super-sensory and all objects of sensory perception must be excluded from the field that notion of truth is applicable to (ibid). According to Frege, thought is also separated from its concrete bearer, since a thought formulated by one person can be formulated by other people. Frege believed that humans were the bearers of representations and sense-impressions. Thought is immediately linked to the truth, thus, it is independent of whether it is acknowledged by a certain person.

According to Frege, the process of thinking does not include the generation of thoughts, but rather their formulation; a scholar does not create, but rather discovers the true thoughts, which exist independently of them in the world of ideas. Truths exist beyond time, they are eternal and immutable. They do not depend on who expresses them. Thus, thoughts can be true, even if no one has formulated them yet. They already exist in the third world and, in principle, can always be formulated.

The common ground between the antipsychologistic positions of Frege and Husserl of the 1st volume of Logical Investigations period is the acknowledgement of the existence of truth that is independent of the cognising subject and that of the qualitative uniqueness and mutual irreducibility of the logical and real necessity. Both, representative of antipsychologism of the period, deem it necessary to distinguish between the objective, ideal and logical content of a thought and the subjective, real and historical process of thinking. Thought does not belong to the consciousness of an individual human being. The laws of logic cannot be based on the laws of psychology. They suggest nothing psychological, no factors of the "life of the soul" as it was the case in, for instance, the psychologism of Mill and Sigwart. They object to psychologistic and naturalistic reductions, according to which the ideal a priori structure, such as the laws of logic, are reduced to empirical facts and the problems of everyday life and routine perception. Both thinkers believe that the irregularity and ambiguity of logical terminology is the central reason behind the existence of psychologism. Thus, a deviation from psychologism, the construction of a "pure" antipsychologistic logic, is related by them to giving more accurate definitions to the basic notions of logic and structuring its terminology. That, which is only declared by Husserl, is the central content of Frege's work. Frege develops the concept, notation, with the help of which he aspires to depart from psychologism and eliminate the ambiguity and logical imperfection of the natural language.

The dispute between psychologism and antipsychologism can also be traced in the history of Russian logical and philosophical thought. In particular, it is reconstructed in the writings of such prominent Russian logicians as M.I. Karinsky, G.I. Chelpanov, and N.A. Vasiliev. Their positions are formulated differently, but they all are committed to a critical analysis of the poles of the antithesis that are widely presented in the Western philosophical thought.

So, for example, M.I. Karinsky's critique of psychologism is presented, first of all, as a critique of J.S. Mill's scepticism. At the same time, Karinsky's position rests upon both the society (temporal) thought and religious philosophy oriented towards ontologism and antipsychologism.

In its turn, G.I. Chelpanov's critique is constructed as a critique of the school of philosophical thought headed by Brentano, whose followers included Husserl and Lipps. At the same time, Chelpanov criticises Husserl of the *Philosophy of Arithmetic* period for his psychologism, i.e. his criticism is aimed at the latter's works written before the shift towards antipsychologism in the first volume of *Logical Investigations*.

An analysis of the problems of psychologism and antipsychologism, which is presented by Vasiliev, embraces the contexts of society (temporal) philosophising, logic, and mathematics. At the same time, his argumentation contains references to religious perception of the world and religious ontology. So, Vasiliev formulates the question about the ontology of deity and answers it himself. "Is a deity obliged to think according to Aristotle's logic, syllogism canons, and Mill's rules of induction? A long time ago, religiousness created the idea of a deity, whose reason is infinitely above human. Thus, there is nothing impossible or absurd in that the logic of a deity is different from human logic" (Vasiliev 1989).

I believe that the key features of the logical and methodological preoccupations of N.A. Vasiliev are determined not only by the attitude to N.I. Lobachevsky's non-Euclidean geometry, but rather the whole context of disputes between psychologism and antipsychologism in logic. Vasiliev's attitude to this dispute was developed on the basis of a critical analysis of the positions of J.S. Mill, B. Erdmann, E. Husserl, B. Bolzano, I. Kant, H. Poincaré, and Frédéric Paulhan.

It is Vasiliev who first overcame the one-sidedness of approaches to interpreting logic by both psychologism and antipsychologism and took a metaposition in relation to the antithesis. Moreover, the Russian logician was first to formulate a metaposition that I call an anti-antipsychologism position in the framework of the discussion between psychologism and antipsychologism. In Russian logical and philosophical thought, this position of N.A. Vasiliev shares a common methodological framework with the anti-antipsychologism of late L. Wittgenstein within Western philosophical thought (see (Sorina 1993, 1997)). At the same time, the priorities of the Russian logician and philosopher and his complete independence from any influences are evident.

Vasiliev's idea of imaginary logic is developed within a broad cultural and historical context. However, I believe that the formulation of these ideas could have hardly been possible beyond the context of the dispute between psychologism and antipsychologism as a certain LCF of the era. Vasiliev clearly rejected both extreme psychologism and extreme antipsychologism. Of importance is that Vasiliev did it not years after the views of the parties had been settled, but right after the publication of a 'manifesto' of antipsychologism – the 1st volume of Husserl's *Logical Investigations*. Vasiliev's perspective:

- opposes B. Erdmann's psychologism;
- opposes E. Husserl's antipsychologism;