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ON THE HISTORY OF LOGIC IN THE RUSSIAN EMPIRE (1850–1917)

O HISTORII LOGIKI W IMPERIUM ROSYJSKIM (1850–1917)

A b s t r a c t

In 1850 a very important decision for the whole history of humanities and social sciences in Russia was made by Nicholas I, the Emperor of Russia: to eliminate the teaching of philosophy in public universities in order to protect the regime from the Enlightenment ideas. Only logic and experimental psychology were permitted, but only if taught by theology professors. On the one hand, this decision caused the development of the Russian theistic philosophy enhanced by modern methodology represented by logic and psychology of that time. On the other hand, investigations in symbolic logic performed mainly at the Kazan University and the Odessa University were a bit marginal. Because of the theistic nature of general logic, from 1850 to 1917 in Russia there was a gap between philosophical and mathematical logics.

Keywords: *Russian Empire; Emperor's command of 1850*, *psychologism*, *philosophical logic*, *mathematical logic*

S t r e s z c z e n i e

W 1850 r. car Rosji Mikołaj I wydał ważny dla nauk humanistycznych w Rosji edykt: wyeliminować nauczanie filozofii w uczelniach publicznych w celu ochrony systemu naukowego od idei Oświecenia. Tylko logika i psychologia eksperymentalna były dozwolone, jeśli prowadzili je profesorowie teologii. Z jednej strony, taka decyzja spowodowała rozwój rosyjskiej filozofii teistycznej wzmocnionej przez nowoczesne metodologie reprezentowane przez logikę i psychologię tamtych czasów. Z drugiej strony, badania w logice symbolicznej prowadzone głównie na uniwersytetach w Kazaniu i Odessie miały charakter marginalny. Ze względu na ogólny charakter teistyczny logiki, w Rosji w latach 1850–1917 nie było związków między logiką filozoficzną i matematyczną.

Słowa kluczowe: *Imperium Rosyjskie*, *edykt Imperatora z roku 1850*, *psychologizm*, *logika filozoficzna*, *logika matematyczna*

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The Russian Empire, which existed from 1721 until the February Revolution of 1917, was the predecessor of the Soviet Union. At one point in 1866, it stretched from Eastern Europe across Asia and into North America. The Russian Empire was a Christian successor to the Mongol Empire; thus it inherited the political type of government with hard centralism and absolutism from the Mongol Empire (however, after Europe-oriented emperors, Peter the Great, Peter III, Catherine II, etc., the Russian Empire became quite westernized). It is necessary to notice that the Mongol Empire was the largest contiguous empire in the history of the world. Formally, the Russian Empire was the successor to the Tsardom of Russia. It became the second largest contiguous empire in the world. At the beginning of the 19th century, Russia extended from the Arctic Ocean in the north to the Black Sea in the south, from the Baltic Sea in the west to the Pacific Ocean in the east. It had the third largest population of the world at the time, after China and British Empire. Ruled by the Emperor, it was one of the last absolute monarchies left in Europe. Accordingly, the political system was the least liberal in Europe, with very high social stratification between the very poor and the very rich.

Nevertheless, in the decade from 1810 to 1820 the Enlightenment philosophy expressed by promising ideas of natural law, social contract, and natural religion became very popular in Russia. Social and political philosophy of western thinkers like Hobbes, Montesquieu, Rousseau, and Voltaire were adopted and developed by progressive domestic authors, such as Aleksandr Radishchev. As a result, noble army officers who had been raised on those Enlightenment ideas organized the Decembrist revolt of 1825 to implement the first constitution in Russia. This uprising was suppressed by Nicholas I, the Emperor of Russia, who since that event was afraid of any expression of political thought that could be associated with the Enlightenment ideas. The news of revolutions in Western Europe in 1848 scared him again. All talk of reform and political philosophy was banned, and travel beyond the Empire's borders was forbidden. The culmination of Emperor's commands of this kind took place in 1850, when the minister of education prepared the Emperor's command to eliminate the teaching of philosophy in public universities in order to protect the regime from the Enlightenment ideas. Notice that some restrictions on the teaching of philosophy persisted until 1889. The best-known appropriate motto of Nicholas I was "The profit of philosophy is not proven, but a damage caused by it is possible" ('Польза философии не доказана, а вред от нее возможен'). Instead of general philosophy (especially social and political philosophy) only logic and psychology were permitted, but only if taught by theology professors:

> „С упразднением преподавания философии светскими профессорами в университетах Санкт-Петербурга, Московском, Св. Владимира, Харьковском и Казанском, а также в главном Педагогическом институте и Ришельевском лицее, возложить чтение логики и опытной психологии на профессоров богословия или законоучителей, назначенных к этой должности по сношению Министерства Народного Просвещения с духовным ведомством Православного исповедания.
>
> Профессоров богословия и философии из лиц духовного сана в означенных выше университетах и главном педагогическом институте сравнить в окладах жалованья с ординарными профессорами,

присовокупив к тому и производство квартирных денег, определенных по этому званию, если они не живут в церковных домах или не имеют казенного помещения...
Программы преподавания логики и опытной психологии утвердить по соглашению духовного православного ведомства с Министерством Народного Просвещения" [40, p. 1414].

"After the elimination of teaching philosophy by secular professors at the universities of St. Petersburg, Moscow, St. Vladimir, Kharkov and Kazan, and also at the main Pedagogical Institute and Lycée Richelieu, assign the teaching of logic and experimental psychology to theology professors or catechists, nominated to this position after the coordination of the Ministry of National Education with the Ecclesiastic Department of the Orthodox Confession.
Theology and philosophy professors from clergy at the universities mentioned above and the main pedagogical institute should be equated in salaries with ordinary professors, adding to that accommodation money according to their position if they do not live in church houses or have no state-issued room...
Syllabi of logic and experimental psychology should be approved after the coordination of Ecclesiastic Orthodox Department with the Ministry of National Education".

That year was the crucial point in the whole history of humanities and social sciences in Russia from 1850 to 1917. On the one hand, social and political philosophy was banned as such. Therefore there were no reflections on the future of societies which would find some effective solutions for social conflicts and inconsistencies in the Russian Empire. Instead of academic social and political reflections the radical Marxist ideas became popular. As a consequence, the unsolved inconsistencies caused the February Revolution of 1917, which occurred March 8–12 (February 23–7, Old Style). The revolution was accompanied by the abdication of Tsar Nicholas II, the collapse of Imperial Russia and the end of the Romanov dynasty. On the other hand, the teaching of logic and psychology was not forbidden between 1850 and 1917. It was in safe hands of theology professors. The Orthodox journals such as 'Faith and Mind' ('Вера и разум'), 'Orthodox Review' ('Православное обозрение'), 'Orthodox Interlocutor' ('Православный собеседник'), etc. very often published papers devoted to different logical subjects.

One of the most noteworthy of theology professors in the Nicholaevan years was *Fiodor Golubinsky* (1798–1854) [12, 13, 14], who is recognized as the founder of the Moscow School of Theistic Philosophy. The School's main feature was subordination of philosophy to theology and epistemology to ontology. In fact, the Emperor's command eliminating the teaching of western philosophy entailed the development of original Russian philosophy, from the Vladimir Soloviev's theistic philosophy of total unity to the semi-theistic philosophy of Russian cosmists. Probably, it was true intention of the minister of education to stimulate Russian own philosophy. In any case, logic and psychology as a part of theology initiated development of the original Russian philosophy as a whole.

At Russian universities and academies there was an original approach to logic within the world trends [2, 3, 4, 41, 43, 46]. For example, *Ivan Skvortsov* (1795–1863) from the Kyiv Ecclesiastic Academy proposed the division of logic into the following three parts: (1) the logic of reason or theory of thinking (notion, proposition, inference); (2) the logic of mind or theory of cognition (analytics of feelings, analytics of common sense and analytics of reason); (3) methodology or the doctrine of application of laws and forms of thinking in the process of cognition. Along with German logicians from Kant to Hegel, the theology professors teaching logic like Skvortsov tended to follow psychologism, a theory of reducing logic to a psychology of thinking. *Mikhail Vladislavev* (1840–1890), *Nikolai Grot* (1852–1899), *Leonid Rutkovski* (1858–1920) were other psychologists. However, their psychologism was not so much empirical but rather of speculative or even theological nature and it had a religious basis [44].

Vasily Karpov (1798–1867), the founder of Russian academic philosophy [20–23], e.g. he translated Plato's main works into Russian for the first time, and wrote one of the first logical handbooks, after the educational reforms of Nicholas I. This handbook was entitled 'Systematic Survey of Logic' ('Систематическое изложение логики' [19]). He argued for the substantial unity of the Self or I, which makes experience possible. This unity is the first obvious fact, which is not epistemological as in Kant's philosophy, but ontological in the Platonic sense as logos creating the world. Developing these ideas, *Alexey Kozlov* (1831–1901) [24–28] from the Kyiv University rejected the independent existence of space and time, assuming that they possessed being only in relation to thinking and sensing creatures. The ontological interpretation of the substantial unity allowed Kozlov to state that all judgments were analytic.

Another Russian philosopher, Mikhail Karinsky (1840–1917) from the St. Petersburg Ecclesiastic Academy continued argumentations against Kant and western philosophy [15, 16]. His main argumentation is that inner experience, unlike outer, makes no distinction between reality and appearance. The ultimate improvable of inner experience, i.e. truths, is called by him "self-evident" [18, 19]. This self-evident should play role of the first premises for all legitimate conclusions [17]. In his opinion, German Idealism is irrationalistic because of the assumption that the reflective self (self-evident) is just subjective and has nothing objective in itself.

After studying the fundamental work in mathematical logic 'Principia Mathematica' written by Alfred North Whitehead and Bertrand Russell, *Pavel Florensky* (1882–1937) proposed to construct a formal logic of antinomies [11] that could be applied in studying the self-evident of the Russian theistic philosophy. For him, this self-evident is presented in dogmas of the Orthodox Church. He believed that Orthodox Christianity was an inconsistent but non-trivial theory and a formal logic of antinomies allowed him to explicate the inconsistent content of Christian dogmas. So, Florensky could be called one of the founders of present-day paraconsistent logic or logic of antinomies.

Thus, logical investigations in Russia since 1850 were inspired by the critical reviews of German transcendental philosophy, first of all by the Kantian one, but in details these investigations have focused rather on the Orthodox theology which had accepted and supported the Platonic tradition of subordinating epistemology to ontology. This feature of Russian theistic philosophy became possible just due to eliminating the teaching of western social and political philosophy from public universities.

The teaching of logic and psychology by theology professors provided theology and theistic philosophy with modern methodology and made them more rationalistic. Many theistic reflections developed later in Russian philosophy were included in the Syllabus of Logic 1850 written for all universities and academies by the scholars of the Moscow Ecclesiastic Academy (the whole text of the Syllabus is contained in the research paper [1]). This Syllabus was accepted by the Holy Synod of the Russian Orthodox Church. It was divided into the following sections: Introduction, On Principles of Reasoning ('О началах мышления'), On Laws of Reasoning ('О законах мышления'), On Forms of Reasoning ('О формах мышления'), On Experienced Cognition ('Об опытном познании'), On Mental Cognition ('О познании умозрительном').

In the Introduction the subject of logic was defined and its relations to other sciences, first of all to psychology, were considered. In the section 'On Principles of Reasoning' it was claimed that the human reflexive self was finite and it had its origin in God as infinite being. Logic was a main tool of the human reflexive self and it should be subordinated to the Revelation that opens the higher substantial unity of the Self. In the section 'On Laws of Reasoning' the following three logical laws were considered: (i) the law of identity, (ii) the law of contradiction or the law of excluded middle, and (iii) the law of sufficient reason. The section 'On Forms of Reasoning' was devoted to concepts, judgements, and conclusions. The section 'On Experienced Cognition' was about forms of experience (observation, experiment, and testimony) and probabilistic reasoning (induction, analogy, and hypothesis) and their connection with the Revelation. In the section 'On Mental Cognition' the relationships between faith and knowledge were considered.

As we see, the Syllabus suggested some theistic reflections which were advanced later by some philosophers. As an example of the theistic nature of this Syllabus, let us quote some passages from the section 'On Principles of Reasoning':

> „Понятие о начале вообще; различие между началом и первоначальным обнаружением, или исходной точкой. Мышление, как деятельность духовная, должно иметь начало внутреннее — в самой природе человеческого духа, оно есть видоизменение его самосознания; посему за коренное начало его должно быть признано то, что есть в самосознающем духе человеческом глубочайшего, деятельнейшего, всеобщего и несомненно истинного.
>
> Глубже всего человеческий дух сознает, что он небезначален, но имеет начало от Существа Бесконечного (действительное бытие идей и Бог в человеческом духе). Идея о Боге и есть именно: а) нечто высшее в нашем духе, — не собственно силою его мышления она производится, но врожденна ему свыше, и по необъятности своего содержания безмерно превосходит все другие представления и мысли наши; б) нечто деятельнейшее в духе, чему единственно обязаны мы непреодолимым стремлением к знанию или истине, которое удовлетворяется только в познании последней, Бесконечной причины всего; в) нечто общее всем людям, хотя различно ими понимаемые; наконец е) есть нечто такое, что не только истинно само в себе, но и составляет единственное условие,

по которому возможно для человека истинное познание предметов, единственное ручательство в согласии законов и форм человеческого мышления с действительным бытием вещей — что могло бы уверить нас в сем согласии, если бы не нашли опоры в Единого истинного Виновника и бытия и мышления?
Таким образом, как удовлетворяющая всем показанным условиям врожденная идея о Боге должна быть признана коренным началом мышления" [1].

"The notion of reason as a whole; the distinction between the reason and the ultimate reason, or a starting point. The thinking as spiritual activity should have an internal reason – in the very nature of human spirit, it is a modification of human consciousness; therefore the deepest, most active, most general, and undoubtedly true in the self-conscious human spirit should be recognised as its fundamental reason.
The human spirit understands most deeply that it has a reason and originates from the Endless Being (the actual being of ideas and God in the human spirit). The idea of God is namely: (a) something higher in our spirit, it cannot be inferred by thinking, but it is innate from above, and by the immensity of its content it immensely surpasses all other images and our thoughts; (b) something most active in the spirit that causes our insuperable aspiration for knowledge or truth which is satisfied only in knowledge of the latter, i.e. in the infinite reason of all; (c) something common for all people, though it can be understood by them differently; and finally (d) it is something that is not only true in itself, but also constitutes the only condition for our true knowledge of things, the unique guarantee of the agreement of laws and forms of human thinking with the actual being of things – what could assure us of this agreement if we did not find a support in the Absolute true Reason of both being and thinking?
Thus, the innate idea of God, satisfying all conditions shown above, should be recognised as the fundamental reason of thinking".

Thus, in spite of the social problems undermining the Russian society from within, in the Russian Empire one can detect a well developed logical tradition that is linked with the theistic philosophy. Meanwhile, for many years logic was out of interest for mathematicians and pure philosophers. Logical investigations in the strict sense were performed mainly at the Kazan University and the Odessa University. These investigations were quite marginal, although they were carried out by well-qualified mathematicians. In Saint Petersburg and Moscow these investigations were not regarded as prestigious because of the fact that logic was considered as too metaphysic and theistic. For example, *Andrei Markov* (1856–1922), the leader of Saint Petersburg mathematicians, considered mathematical logic as unimportant for mathematics at all, in the same way as H. Poincaré did.

Platon Poretsky (1846–1907), the professor of the Kazan University was one of the most known Russian founders of modern logic [29–39]. For example, Louis Couturat

[10] evaluated Poretsky's methods as a culmination in the development of algebra of logic for that period. Poretsky was a mathematician who graduated from the Kharkov University. Then he worked in Astrakhan and Pulkovo. After that he found a position as an astronomer at the Kazan University, but he began to study the works of George Boole [5, 6] and was fascinated by algebra of logic. As a result of these studies, he developed some modern logical calculi with their applications to probability theory.

Evgenie Bunitsky (1874–1952), a professor of the Odessa University, was a known Russian logician specializing in algebra of logic, too [7, 8]. His research interest was in applying some results of algebra of logic into arithmetic, and also in determining the number of terms in logical polynomials. He spent two years (1906–1907) in Göttingen at Hilbert's laboratory, the best laboratory of mathematical logic of that time. In 1922 he immigrated to Prague. Since 1923 he worked at the Russian Free University in Prague.

Another prominent logician who carried out highly rated investigations in mathematical logic in Russia was *Jan Śleszyński* (Ivan Sleshinsky) (1854–1931) [45], a professor in Odessa, then in Cracow; in fact, he became the first professor of mathematical logic in Poland. Some other logicians of that period, like *Ivan Zhegalkin* (1869–1947) [53], a professor of mathematics at the Moscow State University, continued their investigations later after the February Revolution of 1917. Zhegalkin was best known for his formulation of Boolean algebra as the theory of the ring of integers *mod* 2 (the so-called Zhegalkin polynomials). Zhegalkin can be recognized as one of the founders of the mathematical logic group of Moscow State University, which became the Department of Mathematical Logic established by Sofia Janovskaja in 1959. The mathematicians from Moscow, such as I. Zhegalkin, D. Egorov, N. Lusin, started to study mathematical logic from the point of view of set theory and theory of functions of a real variable.

The career of some logicians, like that of *Samuil Shatunovsky* (1859–1929), [42] was quite hard. He was born in Velyka Znamianka, Ukraine, in a poor Jewish family as the 9th child. He completed secondary education in Kherson. He lived in small Russian towns, supporting himself by private lessons. Because of his mathematical papers sent to the Odessa University, he was admitted to the university, received financial support, obtained a degree and was appointed a staff member in 1905. In 1917 he became a professor. Shatunovsky focused on several topics in mathematical analysis and algebra, such as group theory, number theory and geometry, trying to develop axiomatic theories.

Because of the theistic nature of general logic, in Russia from 1850 to 1917 there was a gap between philosophical and mathematical logics. The first was too metaphysic and speculative. The second was too symbolic and without any philosophical reflections. The same situation took place in the USSR: on the one hand, there was philosophical logic called dialectic taught at departments of humanities or social sciences, on the other hand, there was mathematical logic taught at departments of engineering sciences or mathematics. And they had no relationship with each other at all. One of the rare attempts to find out some connections between philosophical and mathematical logics before 1917 was made by *Nicolai Vasiliev* (1880–1940) who proposed for the first time the idea of non-Aristotelian logic, free of the laws of excluded middle and contradiction [47, 49, 50]. Reasoning of that logic was called by him 'imaginary,' by analogy with the 'imaginary' geometry of Lobachevsky. He was also the first to distinguish levels of logical reasoning, and introduced the notion of metalogic [48].

Russian textbooks on logic were of good quality. In many neighbouring countries they were translated into national languages. For example, the book 'Logic as a Part of Theory of Knowledge' [51] written by a prominent Russian philosopher and psychologist, *Alexander Vvedensky* (1856–1925) was one of the most popular Russian logical textbooks. It was translated into Latvian in 1921. In Latvia this translation became the first textbook on logic. The 'Handbook of Logic' written by *Georgy Chelpanov* (1862–1936) had many editions not only before 1917, but also in the USSR and was recently reprinted in Russia as well. Some textbooks like 'Logic' by *Kallistrat Zhakov* (1866–1926) contained references to symbolic logic.

Thus, Emperor's commands of 1850, eliminating the teaching of western social and political philosophy in public universities and permitting logic and psychology to be taught only by theology professors, intensified the development of the original Russian theistic philosophy and weakened any social and political reflections in the Russian society. This feature of Russian humanities and social sciences caused the gap between philosophical and mathematical logics. Hence, the educational policy governs development not only of sciences, but also of societies.

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