



**HAL**  
open science

## Logic and logicians in Russia before 1917: Living in a wider world

Nadezda Orlova, Sergei Soloviev

► **To cite this version:**

Nadezda Orlova, Sergei Soloviev. Logic and logicians in Russia before 1917: Living in a wider world. *Historia Mathematica*, 2019, 46, pp.38-55. 10.1016/j.hm.2018.05.002 . hal-02894309

**HAL Id: hal-02894309**

**<https://hal.science/hal-02894309v1>**

Submitted on 8 Jul 2020

**HAL** is a multi-disciplinary open access archive for the deposit and dissemination of scientific research documents, whether they are published or not. The documents may come from teaching and research institutions in France or abroad, or from public or private research centers.

L'archive ouverte pluridisciplinaire **HAL**, est destinée au dépôt et à la diffusion de documents scientifiques de niveau recherche, publiés ou non, émanant des établissements d'enseignement et de recherche français ou étrangers, des laboratoires publics ou privés.



## Open Archive Toulouse Archive Ouverte

OATAO is an open access repository that collects the work of Toulouse researchers and makes it freely available over the web where possible

This is an author's version published in: <https://oatao.univ-toulouse.fr/26301>

### Official URL:

<https://doi.org/10.1016/j.hm.2018.05.002>

### To cite this version:

Orlova, Nadezda and Soloviev, Sergei  *Logic and logicians in Russia before 1917: Living in a wider world.* (2019) *Historia Mathematica*, 46. 38-55. ISSN 0315-0860 .

Any correspondence concerning this service should be sent to the repository administrator: [tech-oatao@listes-diff.inp-toulouse.fr](mailto:tech-oatao@listes-diff.inp-toulouse.fr)

# Logic and logicians in Russia before 1917: Living in a wider world

Nadezda Orlova <sup>a</sup>, Sergei Soloviev <sup>b,c,\*,1,2</sup>

<sup>a</sup> *Institute of Philosophy, Saint Petersburg State University, 5, Mendeleevskaya Liniya, St. Petersburg, 199034, Russian Federation*

<sup>b</sup> *IRIT, University of Toulouse, 118, route de Narbonne, 31062, Toulouse, France*

<sup>c</sup> *ITMO University, 49, Kronverkski prospekt, 197101, St. Petersburg, Russian Federation*

---

## Abstract

We explore the formation of Logic as an academic discipline and community in Russia before the revolution of 1917. In particular, we look at the various communication strategies that emerged within this community and its relations with the wider international scientific community. Interaction with Mathematics, which was undergoing its own “foundational revolution,” played a major role in the transition from archaic syllogistic to modern formal logic. We make extensive use of original sources, many of which have not been reprinted since their first publication.

*Keywords:* History of science; Logic; Academic community; Communication strategies; Publication activity

---

## 1. Introduction

The relationship between logic and other scientific domains profoundly changed between the beginning of the 18th and the beginning of the 20th centuries. In the 18th century it was perceived as one of the most conservative, stagnant sectors, stretching back to the depths of antiquity and medieval scholastics. Towards the end of the 19th century, however, Logic and logicians came to occupy a central position in the revolution in the foundations of mathematics.

The study of the history of logic before the Russian Revolution of 1917 forms an indispensable part of the background understanding required by our more ambitious investigation into scientific communication in the Soviet period, in which we also focus on Logic. The situation of Logic in the USSR was very peculiar.

---

\* Corresponding author at: IRIT, University of Toulouse, 118, route de Narbonne, 31062, Toulouse, France.  
*E-mail addresses:* [nadinor@mail.ru](mailto:nadinor@mail.ru) (N. Orlova), [Sergei.Soloviev@irit.fr](mailto:Sergei.Soloviev@irit.fr) (S. Soloviev).

<sup>1</sup> S. Soloviev was partially supported by the Government of the Russian Federation Grant 074-U01.

<sup>2</sup> Associated researcher at ITMO University, 49, Kronverkski prospekt, 197101, St. Petersburg, Russian Federation.

On the one hand, it was viewed as ideologically dangerous; but on the other hand, its relationship with the foundational revolution in Mathematics could be readily styled as opposing a bourgeois and regressive intellectual tradition.

In this paper we focus on the communicative strategies within the Russian scientific community, and in the larger context on its interaction with international academia. The communication with international academia was vital for its development.

The study in this paper will help us to understand both the continuities and the often radical changes in the situation of Logic and logicians in the wake of the Revolution. We will investigate the history of Logic in the Soviet period, considered from the same perspective of internal and external communicative strategies, in a separate article.

The history of logic in Russia before the October Revolution of 1917 is not very well studied even in Russian scientific literature. One does find a chapter in the book Makovel'skii (1967) on the general history of logic, and a monograph by Bazhanov (2007) on logic in Russia and the USSR. There are short papers (mostly in Russian) scattered in various scientific journals and conference proceedings. Furthermore, it is worth mentioning the remarkable bibliographic and biographic dictionary "Logika" by Antonova et al. (2001). Its authors tried to gather all available information about Russian scholars who did address in their works at least some problems of logic.

One cannot seriously speak of a professional logical community within the boundaries of Russia before late 18th or early 19th century. Up to the Revolution it remained relatively marginal, but this fact in itself makes Logic a good example and allows us to see more clearly the emergence of logic as a science in a modern sense of this term.

Our choice of the problem of communication as a focal point allowed us to introduce many sources that were, in our opinion, unjustly excluded from the corpus of texts studied by the history of science, to consider many curious examples of discussions, complimentary or critical exchanges on the pages of forgotten books that look more interesting nowadays from the point of view of scientific communication than scientific content.

It allowed us to trace the history of the emergence of Logic as an autonomous area of science within a more or less unified socio-cultural domain, with the personality of a scientist as a center of a complex communicative network. This personality is incorporated in multiple overlapping social structures. Some of these structures may be prohibitive and some supportive for specific scientific activities.

Of course, a necessary preliminary condition of any relevant study is the general understanding (at least sketchy) of the processes that shaped the scientific and intellectual life, as far as they were connected with the emergence of Logic as an autonomous science. Some periodization is necessary as an organizing principle. The years of Peter the Great's reforms and the 1917 Revolution were clearly turning points in Russian history, and they may be suggested as the base of such a periodization. They deeply changed not only the society itself, but also the role of science in this society.

The reforms of Peter the Great created a relatively westernized and large educated class. They also created a schism between this educated class and the rest of the Russian people. Socially this class went through many changes before 1917, but the rupture remained and played a decisive role even in the Revolution itself. Soon all political parties that were seen as parties of the educated people lost popular support. Only a couple of generations later the importance of this rupture gradually diminished, but the price was high, and the totalitarian regime created other kinds of social tensions and contradictions.

However, before the Revolution, academic life was already active. Without a good understanding of this period, it is difficult to speak of what was changed later, and how. After the Revolution, "Marxist" soviet science was often opposed to "Bourgeois" science, especially in social sciences and humanities. The place of logic in this politicized picture was uncertain. The attempts of some scientists to escape political control favored the development of more abstract domains like mathematical logic.

Let us also add a few words about terminology. It is not easy to describe in precise terms a domain of scientific activity in the process of formation. It concerns especially the social aspect of the process. The works of some authors may have no obvious connection with their social status, for example in the next section we mention the sergeants of Horse Life-Guard Ivan Motchul'skii senior and Ivan Motchul'skii junior, who wrote a textbook on logic (Motchul'skii, 1789).

We pay special attention to the aspect of communication, and this helps to give a more precise meaning to several notions used below. An “educated person” means a person who received some kind of formal education, at a school, or university, or even at home, by qualified teachers; the “intellectual community” (in the period we consider) means essentially all people who have participated in the exchange of ideas (in logic, philosophy, religion, and science in general) as writers and readers, lecturers and students. The term “colleagues” concerns people who held some sort of academic position. We hope that an indulgent reader will forgive us for the remaining imprecisions. We used some of the materials (in particular the bibliography) from our article (Orlova and Soloviev, 2016) published in Russian that may be seen as a very early version of this paper.

## **2. The development of pedagogical tradition and the first textbooks on logic**

It is difficult to speak about original logical ideas in Russia before the beginning of the 19th century. But scholars did exist, and the history of interaction of the Russian scholarly community with (as we would say now) the world-wide “web of knowledge” should not be oversimplified, even in such a special domain as logic. Most of the scholars were teachers, though some (very few) could be nobles or priests with enough free time.

The first logical texts that circulated in Russia already in medieval times were some articles from the *Izbornik* (anthology) of Sviatoslav (1073 A.D.) and “Dialectics” of St. John of Damascus. Its first translation into Slavonic language appeared in 10th century A.D. For more details see (Bazhanov, 2007; Antonova et al., 2001; Makovel'skii, 1967).

In the 15th century more translations became available, for example the excerpts from the Maimonides' Treatise on the Art of Logic and Aviasaph's Logic. The translations might have been done in Galicia-Volhynia (also called Galician Rus') or Kiev, and are known to have circulated among the followers of the so called Heresy of the Judaizers that spread in Novgorod the Great and Moscow. (The term “Judaizers” is old, but was used by the Russian Orthodox Church at that time.)

Up to the 19th century almost all texts on logic accessible to Russian language readers were translations. One notable exception is the “Discourse on Logic” written by the Prince Andrey Kurbsky. Kurbsky had been a friend and aide of Ivan the Terrible. Later he opposed the Tsar's repressive politics and escaped to Lithuania. Kurbsky also produced a new translation of “Dialectics” by St. John of Damascus. His translation of the treatise on syllogism by Johann Spangenberg printed in Vilno (Vilnius) in 1584 was the first printed book on logic in the Russian language (Antonova et al., 2001).

Russia was not a passive recipient of information. The selection of texts for translation required an active interest in the outside world and a good familiarity with the sources. Due to instability (not necessarily expansion) of the borders of the Grand Principality of Moscow, that evolved to become the Tsardom, and later the Russian Empire, many texts in foreign languages were in circulation. Logic was taught in Latin at the Slavo-Greco-Latin Academy (a Theological Academy) in Moscow (since 1687) and since 1701 at the Kievian Theological Academy (Kiev being at this time part of the Russian Tsardom). The handwritten texts of these lectures still exist (Makovel'skii, 1967, p. 436).

Among the most significant influences related to logic at the dawn of modern times in Russia, let us mention Leibniz. His correspondence with Peter the Great is well known, and not long before the end of his own life he had even met him. These contacts had influenced Peter the Great when he created the St. Petersburg Academy of Sciences (Anri, 1918). Since then it is difficult to separate Russian and

West-European science. The creation of the Academy by decree of 28 January (8 February) 1724 attracted many foreign scientists to Russia. Let us notice that Latin remained for a long time the main working language of the Academy. The German and later French languages were of primary importance too.<sup>3</sup>

By the way, the initial “layout” of the Academy included the position of professor of Logic. Curiously, the early years of existence of the Academy were marked by a conflict between this professor (the position was kept by a certain Georg Bernhardt Bülfinger, a follower of Leibniz) and Daniel Bernoulli. Bernoulli (justly) viewed himself as a representative of new mathematics and physics, and considered Bülfinger with his logic nothing but retrograde (Mumenthaler, 1996).

In the second half of the 18th century the attitude of mathematicians at the Academy towards Logic started to change. The famous Leonhard Euler’s “Letters to a German Princess on Diverse Subjects of Physics and Philosophy” first published (in French) in 1768 included several letters that discussed logic in a very favorable way. See, e.g., (Euler, 1770).

Euler’s letters were soon translated into Russian by his pupil Rumovsky and certainly were part of the “intellectual context” at this time.

The letters that concern logic “as such” (letters C–CVIII of volume 2) propose nothing new in the definition of syllogisms in comparison with Aristotle. However one may note a skillful use of diagrams that help to explain them. They are called Euler diagrams even today.

It is curious to notice also some of Euler’s remarks about language in general that remind us of some modern discussions around the “philosophy of language.” For example, he suggests that singular propositions are kinds of universal propositions.

What is even more interesting, there are some other letters (letters CXXIII–CXXVI) where Euler discusses infinite divisibility of space. In his time this theme was not seen as related to logic and had no place in the curriculum (Euler criticizes Leibniz’s Monadology). However later it played an important role in the foundational revolution in mathematics and in mathematical logic (the real numbers and the continuum). This example speaks a lot about indirect ways of influence and exchange of ideas.

Due to the reforms of Peter the Great the translation activity increased greatly and texts on logic became much more accessible.

Most of the 18th century was the time of the great “westernizing” efforts of the authorities and important investments in education.

Since Peter the Great, the enrollment of Russian students in various West-European universities should not be underestimated, and it plays a significant role in the interaction of Russia with international academia. Those who had shown capacity for scientific research often obtained state support for their study. In the 18–19th centuries an important proportion of these students studied what was then broadly called “philosophy.”<sup>4</sup> Logic and natural sciences had a respectable place in the philosophy curriculum.

Back from their foreign studies, these students had to interact with the usually more conservative members of the intellectual community who stayed in Russia. It was necessary to find ways to communicate and collaborate with them, and, understandably, the result was some sort of “co-evolution.”

Since Peter the Great’s reign, a stable tradition appears to include the study of the bases of logic in educational programs, and numerous textbooks were published. The textbooks are an interesting example of how logic was gradually included in a complex “web of knowledge” and social connections, sometimes unexpected. To take an extreme case, think about tutors and pupils of military educational institutions.

---

<sup>3</sup> More precisely, until 1734 the minutes of the Academy meetings were kept in Latin, in 1734–1741 in German, in 1742–1766 again in Latin, then again in German, and from 1773 until the mid-19th century in French (Stieda, 1932).

<sup>4</sup> In this period the philosophical faculty at German universities comprised all that was not included in the programmes of Divinity, Law and Medicine. According to the data of A.Yu. Andreev (the results of a study of matriculates of German universities) 926 Russian students studied in Germany during the period 1698–1849. See (Andreev, 2005, p. 22).

According to Makovel'skii (1967), initially the teaching of logic in Russia turned from scholastics to Descartes. For example, the textbook of a follower of Descartes, Edme Pourchot "Institutiones philosophicae" (first published in Paris in 1695) was used in the Slavo-Greco-Latin Academy in Moscow. Later it was strongly influenced by the Germans (Wolff, Baumgartner) and in the end of the 18th century by the French Encyclopedia. A Russian translation of Condillac's "Logic" was published in 1792.

At first, the contribution of Russian scholars was very limited. Usually they did the translation and wrote some sort of didactic preface addressed to the reader. For example, the introduction of the textbook composed by a magister Sergey Andrianovsky speaks about the utility of logic that "helps to order human mind, and teaches to reason soundly," cf. (Anonymous, 1788, pp. 1–2).

As an exception one may mention the inclusion of elements of logic by the famous Russian scientist Lomonosov (1711–1765) in his "Rhetorics" (1748). Lomonosov himself attended the lectures of Ch. Wolff when he studied in Germany. He contributed a lot to the development of Russian logical terminology. In general, however, an almost medieval tendency of "self-effacement" of the translators and commentators was very common.

Sometimes an authorship can be established only indirectly, via other sources. A striking example is (Motchul'skii, 1789). The author Theoctistus was in fact Ivan Motchul'skii (1732–1818). He could be identified thanks to the Russian Bibliographic Dictionary, and because Horse Life-Guard Regiment sergeants Ivan Motchul'skii Senior and Ivan Motchul'skii Junior were mentioned in the Editor's Foreword called "A Gift to Our Teacher."

To see the sergeants (even of an elite regiment) as authors seems peculiar, but it is much less surprising if we look at the historical context. Under the long reign of Catherine II (1762–1796) ambitious pedagogical reforms were performed by I.I. Betskoy (1704–1795) supported by Catherine herself. One of the aims was the creation in Russia of an educated "third estate." Many educational institutions were founded, that included commercial schools and the Smolny Institute for girls. Even military schools (Cadet Corps) at this time got an extended general program. As a matter of fact French, German, and Latin were studied. Usually the pupils stayed from the age 5–6 to 19–20 years. In the end they had a choice between civil and military service. Those who finished their studies with a gold medal got a grant to travel and study abroad for up to three years.

Often the authors emphasize the importance of studying logic in the Russian language, since "the sciences flourish when one studies them in the native tongue," see (Anonymous, 1787, p. 3).

The "word to the reader" allows us to learn something about supposed readership. Sometimes it is explicitly mentioned in the title, as in the case of "A Child's Logic."

Every printed edition had to be approved by state censorship, and the approval was often personified. "A Child's Logic" bears the signature of "Collegiate Counselor, Professor, and Censor" Anthon Barsov (Anonymous, 1787). (Barsov himself is mostly known as an author of grammatical works. He was also one of the collaborators of Betskoy.) This all contributed to the growth of social awareness concerning logic and science in general.

The importance of a textbook could be emphasized also by a dedication to those socially important persons (usually nobility) who sponsored the project. The level of their awareness of the content may be not clear, but in any case they did belong to the expanding social network that supported the spread of knowledge. Sometimes only a dedication allows to identify nowadays the name of the translator or the scholar who compiled the book. Most of the textbooks at this time followed the tradition whereby this name was seen as not very relevant.

The reference apparatus existed but initially there was no established tradition. The textbooks usually referred to the well known texts of European scholars, such as "Logic" by Christian Friedrich Baumeister (translated into Russian from Latin in 1760), or "Logika" by Christian Wolff (translated from German in 1765). At this period (the 18th century and the beginning of the 19th century) the names of Russian authors



were usually not mentioned there at all. One finds no name of the translator in a rather voluminous book (Fakchiolat, 1794).

The book (Rizhskii, 1790) is a good illustration of this “state of the art.” The word “logica” was translated into Russian as “umoslovie,” approximately, “mind discourse.” Rizhskii’s book may be seen as one of the first examples of an analytical text. In the introduction the definition of philosophy was given. It was explained that the aim of philosophy is the refinement of two main human faculties: reason and will. In its turn “Umoslovie” (Logica) helps to achieve a well justified knowledge” (Rizhskii, 1790, p. 4). Afterwards a more detailed classification was developed. The “umoslovie prirodnoe” (Logica naturalis) was linked to Baumeister’s elementary logic (natural capacity to learn and reason) and Wolff’s logic (capacity to train oneself to seek the truth). The “umoslovie iskusstvennoe” (Logica artificialis) or “umstvennaya philosophia” (Philosophia rationalis) was linked to Hollmann’s logic. The author cited also Plato, Aristotle, Leonhard Euler’s letters, etc. The table of contents may give a clear idea about the intensity of study of the philosophical categories and discourse that were expected, and the high level of requirements imposed on students:

First part. On the actions of mind. On concepts. On words and terms. On definitions and distinctions. On discourse and propositions. On logic and syllogisms. On compound and irregular syllogisms.

Second part. On the truth in general. On evidence of truth. On first principles of truth. On cognition of truth. On errors.

Third part. On the correct use of concepts and discourse. On correct use of logic and syllogisms. How to gain knowledge from contemporaries, and books. How to pass one’s own knowledge to others.

### **3. Formation of a professional logic community**

During the 19th century, and especially towards its end, the logic community expanded, and its interconnectivity grew, as may be seen from mutual references. Now the textbooks and lecture courses usually mention not only the texts of great logicians of the distant past, but also some Russian colleagues.

As we noticed above, due to Peter the Great’s reforms the intellectual community in general became much more heterogeneous. The monopoly of the almost exclusively religious education was effectively destroyed. In modern historiography the term “university philosophy” is often applied to Russian philosophy of the 19th century. The Academic University at Saint Petersburg was founded in 1725, the Moscow University in 1755. In 1802 appeared the Derpt (Tartu) University. In 1804 Alexander I signed the university Charter. In 1804 was founded the University of Kazan, the Kharkov University in 1805, in 1819 the University of Saint Petersburg (different from the Academic University). One might think to use the term “university logic” along with “university philosophy,” but in difference from philosophy this logic was not so much different from the logic that was taught in theological Academies.

However even in the 19th century study abroad did remain a distinctive trait within the community. In the beginning of that century the “Göttingen students” brought home and subsequently made popular the philosophy of Kant, Fichte, Hegel. Logic in the sense of these philosophers was very far from formal “scholarly” logic, but it laid claim to the absolute in much stronger terms. Hegel especially had a lot of followers among the educated classes. It became a kind of “fashion” to dismiss more traditional logic as purely scholastic.

The tensions created by the divergence of views on the meaning of logic often pushed Russian logicians towards certain forms of psychologism. For example, V.N. Karpov (1798–1867), highly appreciated for his commented translation of Plato into Russian, was opposed to the influence of German philosophy that



he deemed too strong. To undermine its ambitions, he connected the origins of logic with psychology (Makovel'skii, 1967).

Towards the end of the century the importation and exchange of ideas became too active to mention all the names. Let us mention however the influence of French positivism (A. Comte). The trends in English philosophy and logic also attracted some serious attention (especially J.S. Mill, H. Spencer, and the pioneering works of G. Boole on mathematical logic).

Let us list now some frequently cited names. For example, the professor of Moscow University M.M. Troitskii (1835–1899) in his logic textbook (Troitskii, 1886) within the space of one page (p. 12) mentions P.D. Lodii (1764–1829) and his work (Lodii, 1815), V.N. Karpov (1798–1867) and (Karpov, 1856), A.I. Raikovskii (1802–1860) and (Raikovskii, 1857), O.M. Novitskii (1806–1881) and (Novitskii, 1841), A.E. Svetilin (1841–1887) and (Svetilin, 1882), N.V. Bugaev (1837–1903), V.V. Lesevitch (1837–1905).

A brief outline of the background and career of these authors shows clearly the repartition (not rupture) between more traditional centers of logical education and western influences.

P.D. Lodii was born and studied in Austria-Hungary. First he taught in Lviv and Krakow, and since 1803 at St. Petersburg University.

Karpov and Novitskii studied in the Kiev Theological Academy. Later Karpov moved to St. Petersburg and in 1835 became professor at the Theological Academy there. Novitskii taught at Kiev University. Raikovskii and Svetilin studied in the St. Petersburg Theological Academy. Raikovskii became professor of theology at St. Petersburg University and Svetilin at the Theological Academy.

Troitskii himself studied in the Kiev Theological Academy, but later he continued his studies in Germany (in Jena he attended the lectures by K. Fischer, in Göttingen by R.H. Lotze and G. Teichmüller, in Leipzig by G.T. Fechner). Later he worked at Kazan, Warsaw and Moscow Universities. At Moscow University he became dean of historico-philosophical faculty. In 1885 he was one of principal founders of the Moscow Psychological Society.

N.V. Bugaev studied at physico-mathematical faculty of Moscow University. In 1863 he got his master's degree in mathematics there and was sent for two and a half years to continue his studies in Germany and France (he followed the lectures by K. Weierstrass, E. Kummer, J. Liouville, and M. Chasles). Later he became professor of mathematics at Moscow University and correspondent member of the St. Petersburg Academy of Sciences. Since 1891 he was President of the Moscow Mathematical Society. He was interested in philosophy of mathematics (Bugaev, 1898).

Lesevitch studied at the St. Petersburg Military Engineering School and in 1856–59 served in the Caucasian army. In 1861 he graduated from the General Staff Academy but retired from the Army in 1862. In his philosophical views he was close to positivism (A. Comte, L. Feuerbach), but interested in gnoseological problems (later he turned to Neo-Kantianism, and to the empiriocriticism of R. Avenarius). In 1879–80 he was exiled to Siberia for his connections with political radicals, and could return to St. Petersburg only in 1888. In his latest years he published several papers about Buddhism and its history.

To the end of the 19th century books on logic had usually the form of a well-structured and well-commented survey, and often developed some serious original ideas. The tradition of detailed analysis of all usual logical axioms was established already in the 1840s, for example in logical treatises by Novitskii and Paschenko (Troitskii, 1886, p. 86).

A new type of publication that appeared in this period was published lecture notes, either written and edited by students, or lithographed author's manuscripts, as in the case of "History of Logic" by P. Kapterev (1849–1922), see (Kapterev, 1880). In his course, besides the usual references to Aristotle, a special attention was paid to the problem of distinction between the methods and subjects of logic and psychology, very popular at this time. The two main directions in the development of logic were fixed: the direction of syllogistic or deductive (formal) logic and that of inductive (real) logic, cf. (Kapterev, 1880, p. 2). He underlined that in the works written by Russian logicians (Svetilin, Diguitis, and Struve) the formal element was very pronounced. Among other Russian logicians working in this direction, Kapterev recommended professor

Vladislavlev, whose book was “very lively written and easily accessible” to the reader (Kapterev, 1880, pp. 10–11).

Towards the beginning of the 20th century the type of textbook that was not just a commented translation of some Western sources, but an analytical treatise based on both the Western tradition and more recent Russian studies was well established. The historical method remained a dominant strategy that helped to teach logic as a basis of disciplined thought (understandable in a time of great scientific discoveries, revolutions, and doubts). A typical explanation was that only the historical school may provide a “solid and objective basis” for the study of logic (Bobrov, 1913, p. 1).

The works of contemporaries were cited now more often, but the tradition of mutual references was not yet very stable. For example, when an eminent logician, professor Karinskii wrote about the quest for optimal logical systems in the history of logic, he pointed towards its Aristotelian beginning. Making the list of authorities in logic, he said vaguely “and some Russians as well,” but did not mention any names, (Karinskii, 1880, p. 11).

Numerous works were devoted to the critical analysis of the writings of colleagues, an evidence that the logical community in Russia was already formed. One may see who the recognized scientific authorities were and what themes of discussion were most popular.

As an example one may take the essay (Bobrov, 1912) by E.A. Bobrov (1867–1933) about the book (Yagodinskii, 1909) by I.I. Yagodinskii (1869–1918). Bobrov underlined that Yagodinskii was generally considered as the best Leibniz scholar in Russia, who had developed a new way to study Leibniz’s Monadology through the deep analysis of his enormous correspondence.

Bobrov concluded that Yagodinskii’s book “by its main ideas is original and new.” Yagodinskii strived to give the due credit to the works of Russian logicians that were valuable and not without originality, but remained essentially unknown to Western scholars (Bobrov, 1912, p. 79), and underestimated in Russia. Bobrov remarked (rather bitterly) that if Yagodinskii’s book were published in German, then in the large corpus of German philosophy it would not pass unnoticed.

The impressive bibliography distinguished Yagodinskii’s book from most of the publications of his contemporaries. Let us mention some names and references from his list: M.I. Vladislavlev (1840–1890) (Vladislavlev, 1872), N.Ya. Groth (1852–1899) (Groth, 1882), P.S. Poretskii (1846–1908) (Poretskii, 1902b, 1884),<sup>5</sup> F.A. Zelenogorskii (1839–1908), G.E. Struve (1840–1912) (Struve, 1900), M.I. Karinskii (1840–1917) (Karinskii, 1880), L.V. Rutkovskii (1859–1920) (Rutkovskii, 1888), N.N. Lange (1858–1921) (Lange, 1898), A.I. Vvedenskii (1856–1925) (Vvedenskii, 1909), E.L. Radlov (1854–1928) (Radlov, 1880), E.A. Bobrov (1867–1933), P.E. Leikfeld (1859–193?) (Leikfel’d, 1890), G.I. Chelpanov (1862–1936) (Chelpanov, 1906), and N.O. Losskii (1870–1965) (Losskii, 1904, 1908).<sup>6</sup>

The detailed analysis of the content of all the works that were cited is not our task in this paper. Let us look more closely, however, at the works and scientific career of M.I. Karinskii, as one of the most prominent scholars and a somewhat typical representative of the generation born in the mid-19th century.

As many other logicians of this time, he studied at the Moscow Theological Academy, that he had finished in 1862. In 1868, he applied for a position at the chair of Metaphysics at the Saint Petersburg Theological Academy, vacant after the death of V.N. Karpov. In 1869 he became a lecturer there.

In 1871–72 he was sent on a mission to Germany to learn “the state of the art” in his domain. As a mission report he presented in 1873 the memoir called “A critical survey of the latest period of German Philosophy” and was elected an extraordinary professor of the Academy. The same year, the memoir was published, first as a series of articles in a journal, and later as a separate book (Karinskii, 1873). In 1880 he defended (at

---

<sup>5</sup> The standard Latin transliteration is actually Poretskii, but his name was often spelled “Poretsky.”

<sup>6</sup> Often spelled Lossky.

the Saint Petersburg University, not at the Theological Academy) his doctoral thesis “Classification of Derivations” (Karinskii, 1880) and was elected ordinary (i.e., full) professor of the Academy.

For Karinskii logical derivations were not the derivations in the sense of formal rule-based logic more familiar to us (and even less in the sense of mathematical logic, where the rules are seen merely as formal transformations of syntactic expressions). He criticized the classifications of derivations that appear in Aristotelian syllogistics and in inductive logic of F. Bacon and J.S. Mill. According to Karinskii, the opposition between inductive derivation and syllogism was artificial and distorted the meaning of derivations. His own approach was based on a subtle analysis of different forms of subject-predicate relations. By certain modern researchers he is considered as a precursor of phenomenology, cf. (Bazhanov, 2012a).

Logic occupied an important, but not predominant place in his work. He worked also in philosophy, history of philosophy, and history of religions.

It is interesting to notice that some of his logical (but not philosophical) works were reprinted in the USSR under Stalin.

One of his main works was “The Infinite of Anaximander” (Karinskii, 1890). In 1890s he published a series of papers critical towards Kant (his *a priori*ism) and Neo-Kantians. His book (Karinskii, 1893) was based on these papers.

One of his students, the future Metropolitan Anthony (Khrapovitskii) later remembered (Khrapovitskii et al., 1918), that Karinskii was a deeply religious person but never gave references to Christian faith in his logical or philosophical lectures. The content of his works was mostly influenced by the contemporary intellectual context and his critical attitude towards various trends in philosophy.

In spite of all the differences, the biographies of the scientists mentioned above show that the Russian empire was at this time (at least, as far as scientific ideas and research are concerned) a unified socio-cultural space. For example, N.Ya. Groth was born in Helsingfors (Helsinki) and later was professor at the Kharkov (Kharkiv) university. E.A. Bobrov was born in Riga, studied in the Yuryev (Derpt, Tartu) University, taught at Kazan, Warsaw, and in the end of his life Rostov-on-Don University.

We would like to stress also a new accent that became apparent by the end of the 19th century. More and more often serious attention was paid to the relationship between mathematics and logic. The textbooks for students interested in mathematical logic had begun to appear, e.g., Bobynin (1886). The importance of mathematics to logic (not the other way round) was not easily accepted. Bobrov emphasized the relevance of the logical laws of identity and contradiction to mathematics, since these laws “guarantee it its character as a science” (Bobrov, 1913, p. 80). However he directed some criticism towards mathematics because its “correctness” is based on “formal” truth rather than “material” truth.

What is the role of discussions in the development of a science? The scientific community needs to define itself more clearly, to accommodate (or reject) new influences. One may see in the discussions a sign of growing self-awareness.

To logic, the revolution in mathematics that started in the 19th century was of utmost importance. The (often violent) discussions that it had provoked may be seen as a kind of “rite of passage.” By the beginning of the 20th century this revolution resulted in the so called “crisis of foundations.” Logic played a seminal role in this crisis, and was itself radically transformed.

The logical community in Russia at this time was already a highly integrated part of the scientific community in general. The logicians could not ignore the ongoing changes in the neighboring scientific domains. The academic community and the communication strategies within were influenced also by rapid social changes and ruptures in Europe and elsewhere.

It may seem as a paradox, but some government measures that were considered as reactionary by contemporaries could in fact favor the progress in other directions, for example the decree of 1850 “On Discontinuation of the Course of Philosophy in Universities and its Replacement by two other Disciplines: Psychology and Logic” certainly encouraged the development of logic as a profession (Kolchinskii, 2003, p. 258).

The development of logic was subject to many opposing tendencies. As V.A. Bazhanov, a well-known specialist in the history of philosophy and logic, justly notices in (Bazhanov, 2007, p. 10): “The Russian logical thought of the 19th [and] beginning of the 20th century . . . was dominated by psychologism (and a sort of anthropologism). . . . This situation slowed down the development of logic in its mathematical form.”

Up to the beginning of the 20th century the teaching of mathematics was based essentially on the *Elements* of Euclid (first translated into Russian in 1735). They were seen as a model of logical clarity and rigor. One of the turning points in history of science that opened the way to the revolution in mathematics was the discovery of non-Euclidean geometries. This discovery influenced logic as well, in an indirect way at first, since it cast doubts on self-evidence and incontestability of axioms and postulates.

Logic before the beginning of this troubled period changed very little since the epoch of Aristotle. In 1911 N.A. Vasil’ev, one of the talented representatives of the younger generation of logicians, gave lectures at Kazan University. He underlined that:

in the 19th century started the emancipation of logic from Aristotle. The main stages of this movement were: Hegel’s metaphysical logic, Mill’s discovery of laws of scientific induction and his criticism of syllogism, Sigwart’s criticism of the modalities of judgment . . . and finally the creation of mathematical logic in the works by Boole, Schröder, and Poretskii (Vasil’ev, 1989, p. 126).

It is well known that the first steps of the foundational revolution in mathematics were due to both the works of Russian and West-European scientists. As we already noticed, these communities by the end of the 19th century were connected very closely. Often scientific articles were published in foreign languages (at this time usually French or German), even in case of the first publication.

The motivation to publish a paper abroad and/or in foreign language could be the desire to make it more largely known. It could also be part of a strategy: to try alternative ways towards acceptance of the author’s ideas.

P.S. Poretskii in his article “From the domain of mathematical logic” published in Russian (Poretskii, 1902b) cited his own publications in French: “Quelques lois ultérieures de la théorie des égalités logiques” (Poretsky, 1902a) and “Sept lois fondamentales de la théorie des égalités logiques” (Poretsky, 1899) that appeared at Kazan University where Poretskii worked. He cited also the “Théorie des égalités logiques à trois termes a, b, c” (Poretsky, 1900), and “Exposé élémentaire de la théorie des égalités logiques à deux termes a et b” (Poretsky, 1901) that appeared in Paris.

The interest to his works might have been greater in France than in Russia. At the same time his growing international reputation may have helped their acceptance in Russia.

Science may be international, but the research communities in different countries influence each other in different ways, and some are more receptive to certain ideas than others. Often a tortuous way to recognition is more efficient than any direct attempt to convince the colleagues. A good example is the history of apparition and subsequent acceptance of N.I. Lobatchevskii (1792–1856) works on non-Euclidean geometry. One may recall also Galois, see (Infeld, 1978).

#### **4. Interaction with the international community and the role of mathematics**

The first work by Lobatchevskii<sup>7</sup> on the 5th postulate and the foundations of geometry was written in French and titled “Exposition succinte des principes de la géométrie avec une démonstration rigoureuse du théorème des parallèles” (Lobachevskii, 1945, p. 12; Izotov, 1993, p. 7). The question of how this work was presented: as a talk or a manuscript distributed for reading is still disputed, but for us it is not of

---

<sup>7</sup> Often spelled Lobatchevsky or Lobatschewsky.

primary importance. Later, in 1829–30, in “Kazan’s Herald” (a journal) its Russian version was published under the title “On Elements of Geometry.” In 1835–36 in the “Proceedings of the University of Kazan” the “Imaginary Geometry” was published (also in Russian) and, as a continuation, the “Application of Imaginary Geometry to Some Integrals.”

In the same “Proceedings” in 1835–1838 he published also his “New foundations of geometry with a complete theory of parallels” (about 400 pages). The reaction in Russia that was provoked by these publications was rather hostile, without serious attempts to understand what was actually done. It is known that M.V. Ostrogradskii (1801–1861), a very influential mathematician from Saint Petersburg, and his followers “were prejudiced against all that was written by Lobachevskii” (Lobachevskii, 1945, p. 17). The causes of this hostility (only partially related to the essence of Lobachevskii’s works) are considered in (Izotov, 1993), but these nuances do not change the general picture.

Trying to attract attention to his research, Lobachevskii published a brief presentation of his works in German (Lobatschewsky, 1840). Soon after in his letter to J.F. Encke, C.-F. Gauss wrote:

I am making reasonable progress in learning to read Russian and this gives me a great deal of pleasure. Mr. Knorre sent me a small memoir of Lobachevsky (in Kazan), written in Russian, and this memoir, as well as his small German book on parallel lines (an absurd note about it has appeared in Gersdorff’s Repertorium) have awakened in me the desire to find more about this clever mathematician. As Knorre told me, many of his papers are in the Russian Proceedings of Kazan University. (Lobachevskii, 1945, p. 19).

In the aspect of scientific communication, it is interesting to notice that Gauss, probably, began to study Russian before he learned about the works of Lobachevskii. Ernest Knorre (or Knorr) mentioned in this letter was one of the professors of Kazan University who met Gauss. Gauss supported the election of Lobachevskii as a corresponding member of the Royal Society of Göttingen.

The posthumous publication of Gauss’s correspondence attracted the attention of the western-European scientists to Lobachevskii’s works. The publication of (Lobatschewsky, 1840) also played an important role. In 1866, the “Geometrische Untersuchungen” were translated into French, and Gauthier-Villars published it as a book. In Germany the original 1840 edition was reprinted in 1887. Slightly later, in 1891, an English translation was published by the University of Texas at Austin.

The way of revolutionary scientific ideas towards recognition is often tortuous everywhere, not only in Russia. Gauss himself, one of the most renowned mathematicians of the 19th century, would not risk to publish his own ideas about non-Euclidean geometries. The role of the “emigration” (and subsequent “homecoming”) of ideas in this respect obviously is not to be neglected.

In Russia by the end of 1860s, not without the influence of Gauss and Western mathematicians, a new interest to the works of Lobachevskii awakened. The journal “Matematicheskii Sbornik”<sup>8</sup> created in 1866 published in 1868 (vol. III) the article “On the theory of parallel lines by N.I. Lobachevsky.” The original author’s text is followed there by “An extract from the correspondence between Gauss and Schumacher” and a Russian translation of the “Geometrische Untersuchungen.”

In 1886 the University of Kazan published the second volume of the *Collected Works by N.I. Lobachevskii* that included, in particular, the works published earlier in foreign languages (Lobachevskii, 1945, p. 21). By the way, one of the first proponents of Lobachevskii’s ideas in Russia was a Kazan University professor of mathematics A.V. Vasil’ev, the father of the logician N.A. Vasil’ev.

We pay so much attention to mathematics here because we think that it was Russian *mathematics*<sup>9</sup> that attracted first the interest of Western scientists. It awakened their interest to Russian *logic* as well. Later,

---

<sup>8</sup> The English translation of this journal is published since 1995 under the name “Sbornik: Mathematics”, so we leave the name without translation (it means approximately “Mathematical collection”).

<sup>9</sup> For example, the names of P.L. Chebyshev (1821–1894) and S.V. Kovalevskaya (1850–1891) became universally known.



in Soviet times, mathematical logic became one of the leading domains of logic where the control of the dominant ideology was relatively limited.

By the end of the 19th century the role of scientific congresses and conferences began to increase. For logic and logicians the International Mathematical Congresses and the International Congresses in Philosophy (that later became the World Congresses in Philosophy (Soulié, 2014)) were especially important.

Already in 1893 many European and American mathematicians met for the first time at the International Mathematical Congress in Chicago, USA. In its Proceedings the paper (Pervouchine, 1896) sent by the University of Kazan was published. I.M. Pervushin (spelled “Pervouchine” in French, the language of this publication) was a provincial orthodox priest turned number theorist, in his paper he developed an original method to study very large prime numbers.

The Chicago Congress is often considered separately from the subsequent International Congresses of Mathematicians (ICM). It was held in connection with the World’s Columbian Exposition at Chicago, the Organizing Committee was local, and the international attendance was relatively low. The contributed papers whose authors could not come were read at the Congress. A prominent foreign mathematician, Professor Felix Klein of Göttingen, did come in person and was elected Honorary President. “Forty-five mathematicians attended the mathematics section, three of them, in addition to Klein, coming from abroad” (Albers et al., 1986, p. 2).

The first ICM was organized at Zurich in August 1897 (ICM1, 1898). Among the organizers we see A.A. Markov (1856–1922) known for his contributions to Probability Theory. He was the father of another A.A. Markov, Soviet logician, and a “founder” of constructive mathematics and logic. The Zurich Congress was attended by 212 participants, among them 12 that represented the Russian Empire.

The official languages were French and German (below we shall quote the titles in the original spelling and without translation, as they were published in (ICM1, 1898)).

The plenary talks were given by such prominent mathematicians as H. Poincaré, F. Klein, G. Peano (the theme of his talk was “Logica matematica”). Among the section talks was the talk by C. Burali-Forti “Les postulats pour la géométrie d’Euclide et de Lobatschewsky.” A.V. Vasil’ev presented the works of I.M. Pervushin. (It was published as “Formules pour la détermination approximative des nombres premiers, de leur somme et de leur différence d’après le numéro de ces nombres. Note adressée au Congrès par M. J[ean]. Pervouchine et traduite par M. A. Vassilief.”) Let us mention also N.V. Bugaev (N. Bougaïev. “Les mathématiques et la conception du monde au point de vue de la philosophie scientifique”), and N.E. Joukovsky (ICM1, 1898).

In August 1900 Paris welcomed the First International Philosophical Congress (IPhC1, 1900) and immediately afterwards the Second International Congress of Mathematicians. The Congresses were closely related, in particular many scientists participated in both. One of the main organizers of the philosophical congress was Louis Couturat, a prominent French logician. He presented at the Congress the talk by P.S. Poretsky from Kazan University (IPhC1, 1900). Among the participants one finds the names of V.N. Ivanovskii (1867–1939), B.N. Chicherine (1828–1904), A.V. Vasil’ev (1853–1929). Famous mathematicians and philosophers, for example, H. Poincaré, G. Peano, H. Bergson, B. Russell took part in the Congress.

The total number of participants of the Second International Congress of Mathematicians was 248. Here is the list of participants who represented the Russian Empire (ICM2, 1902, pp. 58–115)<sup>10</sup>: I.V. Meschersky (1859–1935), I.L. Ptashitsky (1854–1912), O. Sabinina (1833–1909), V.I. Shiff (1860–1919), D.F. Selivanov (1855–1932), D. Sintsov (1864–1946), G. Suslov (1857–1935), M. Tikhomandritsky (1844–1921), A.V. Vasil’ev (1853–1929), N. Zabudsky (1853–1917).

---

<sup>10</sup> The spelling of names is taken from there.

The discussions about foundations of mathematics, the theory of sets, the recently discovered paradoxes, such as the paradox of Burali-Forti, and the famous Russell paradox, of course very much concerned logic and pushed logicians to change their view of their own science in order to keep pace with modernity. (Russell told about the paradox he discovered in a letter to the prominent logician Gottlob Frege. This discovery forced Frege to abandon a considerable part of his conceptions. The information about the paradox spread quickly through the mathematical and logical professional communities.)

Philosophers, logicians and mathematicians on the brink of the 20th century started to understand the mutual importance of the new mathematics and the new logic, and felt deeply the connections between mathematics and logic. One of the emerging directions in the philosophy of mathematics was logicism (represented, for example, by Frege and Russell).

Subsequently, the International Philosophical Congresses (IPhC) and the International Congresses of Mathematicians (ICM) were going almost “hand in hand” up to 1912: II IPhC, III ICM (1904), III IPhC, IV ICM (1908), IV IPhC (1911), V ICM (1912).<sup>11</sup>

Afterwards, the First World War (1914–1918) and its aftershocks created a deep schism and alienation, and the series of congresses were interrupted for a long time (Albers et al., 1986).<sup>12</sup>

However there is no doubt that the truly exceptional period of intellectual creativity and interaction before the War had very strong and lasting consequences for mathematics and logic everywhere, including Russia.

## 5. On the eve of a Great Revolution

The tone of works published by the logical community changed in the beginning of the 20th century, especially at the brink of the Great War. Now often the tone was critical, even violent towards colleagues.

Even purely academic works of some logicians of the younger generation, for example, N.A. Vasil’ev (1880–1940) (Vasil’ev, 1913) (he was the son of A.V. Vasil’ev and also worked in Kazan) and I.D. Mendeleev (1883–1936) (Mendeleev, 1913, 1914) (the son of the famous chemist D.I. Mendeleev), were, in a sense, an anticipation of another epoch. The rupture with the anthropological point of view, so popular in the 19th century, can be felt there very strongly (cf. Bazhanov (2012b)).

In his works N.A. Vasil’ev cited such “cutting edge” modern scientists as Russell, Peano, Poincaré, Hilbert, Bolzano, Hamilton, philosophers Brentano, Schleiermacher, Lotze as well as Russian logicians Poretskii, Karinskii, Vvedenskii, etc.

The extensive knowledge by I.D. Mendeleev of the main logical and mathematical works of his time is indisputable. He traced his own way among the ideas of mathematicians, such as Abel, Grassmann, and Hamilton, and logicians, as Boole, Schröder, and Poretskii. He cited the most recent works by Hilbert, Peano, and Russell. In his books he discussed many ideas that played later an important role in mathematical logic. For example, some of them were developed in a detailed way in Hilbert’s finitism: “Not only the domains of [immediate] experience, but also the theoretical domains in natural sciences are the finite ones” (Mendeleev, 1914, p. 16).

He is deeply interested in the consistency of mathematical systems, the theme that gained later prominence in the classical works by Hilbert, Gödel, Tarski, and Gentzen. He is critical towards logicians (e.g., Frege and Russell), and close to the views of Poincaré, who was one of the predecessors of Intuitionism. References to some just published works in quantum mechanics (in 1913–1914) may give an idea of the broadness of his views.

<sup>11</sup> Except Paris in 1900, not at the same place, but still leaving a reasonable possibility to attend both.

<sup>12</sup> The ICM until 1920 and IPhC until 1924. The Germans and the representatives of other “Central Powers” were banned until 1928. Russians were mostly discouraged for political reasons. Moreover, because of a controversy about the venue (the ICM of 1920 was initially planned at Stockholm but held at Strasbourg) since 1920 the ICM were no more numbered.



It is not our aim to evaluate the contribution of I.D. Mendeleev to the development of the methods of mathematical logic. In any case, his approach and the ideas he discussed look very modern for his time. His writings may be easily seen as a part of those professional scientific disputes that attained their full scope ten or twenty years later.

In the 1900s the polemical exchanges started to occupy a special place in the activities of the logical community in Russia.<sup>13</sup> To some extent this was due to the relaxation in censorship after the revolution of 1905–1907, but a general feeling that “the times are changing” also played its role. A polemical exchange with Vvedenskii forms the centerpiece of the book “From criticism to ethical gnoseology. A refutation of the criticism by prof. A.I. Vvedenskii. Introduction to ethical gnoseology” (Mendeleev, 1914).

An interesting fact is that a significant part of these polemical “duels” did appear in printed form. As one of the active polemicists, S.I. Povarnin, wrote in his book (Povarnin, 1918): “A written dispute, in general, is a much more convenient way to find the truth than a spoken one. . . but it has other drawbacks. It may take too long a time – occasionally over several years.”

Some other notable exchanges that have been recorded in writing include: N.O. Losskii vs. A.I. Vvedenskii; S.I. Povarnin vs. N.O. Losskii; I.S. Prodan vs. A.I. Vvedenskii. . . It is particularly worth pointing out that the same person would often occupy different positions in different threads of polemical exchange. For instance, in the discussion Prodan vs. Vvedenskii the latter was supported by N.O. Losskii, S.I. Povarnin, I.I. Lapshin, and V.M. Karinskii who criticized each other on other occasions (cf. Lapshin (1917)).

Passions could run high (I.S. Prodan threatened to sue Vvedenskii for defamation), but these discussions certainly forced the participants to give a more precise form to their ideas, to fix the terminology and to raise scientific standards. As a rule, even indulging in acerbic irony and critical attacks bordering on the libelous, the opposing parties would try to follow each other’s argumentation step by step, to quote extensively the disputed passages, and to develop their own arguments. The criteria and terminology used by opponents often reflect the new trends observed worldwide, e.g., Povarnin wrote about the “formal inconsistency of philosophical constructions” developed by Losskii (Povarnin, 1911). Losskii, though far removed from mathematical logic, called his philosophy “intuitivism.” Sometimes there is an appeal to the “inquisitive and attentive reader,” and this is not merely a figure of speech: a substantial community did in fact exist to read these polemical books and brochures in logic (many of them published by private editors).

These academic discussions were not politicized, in contrast with the discussions in the 1920s, after the Revolution. The polemical exchanges that remained to some extent possible in the 1920s were subject to other rules and constraints. Still, one may ask whether the sharp spike in the academic discussions before the Revolution was a precursory sign of the approaching political changes, or the reflection of another, scientific, revolution, or both.

## 6. Conclusion

In this paper we considered the process of the formation of the professional logical community in Russia. We were especially interested in the development of various communication strategies within this community and in its relations with international academia. Main attention was paid to the period 1700–1917. We considered different kinds of publishing activity, different forms of reference (to recognized authorities and to colleagues, the latter developing slowly), and some examples of polemical exchanges. It seems that in Russia during this period printed works (mostly books and brochures) played the role of public places that helped to organize informal coalitions and develop polemics. We plan to consider the profound changes in the life, scientific activities, and communication strategies of this community after 1917 in another article.

---

<sup>13</sup> In much more detail this polemic “fever” is studied in Orlova (2016).

## Acknowledgments

We would like to express our thanks to the anonymous referees who helped to improve the content and structure of the paper and to our colleagues Martin Cooper, Ralph Sobek and Matvey Soloviev who helped to improve its style.

## References

- Albers, D.J., Alexanderson, G.L., Reid, C., 1986. *International Mathematical Congresses: An Illustrated History, 1893–1986*. Springer-Verlag.
- Andreev, Yu.A., 2005. *Russkie studenty v nemetskiikh universitetakh XVIII — pervoi poloviny XIX veka* (Russian Students in German Universities of the XVIII – First Half of the XIX Century). Znak, Moscow (in Russian).
- Anonymous, 1787. *Detskaya logika, sochinennaya dlya upotrebleniya rossiiskogo yunoshestva* (A Child’s logic, composed for use by Russian youth). N. Novikov’s University Printing Press, Moscow (in Russian).
- Anonymous, 1788. *Kratkaya logika, ili umoslovie, sluzhashchee v pol’zu Rossiiskomu Yunoshestvu*. Perevedena s nemetskogo yazyka (Precis of logic. or reasoning, to be employed to the good of Russian youth). The Senate Printing Press on the Expense of A. Svetushkin, Moscow (in Russian). Translated from German.
- Anri, V.A., 1918. *Rol’ Leibnitsa v sozdanii nauchnykh shkol v Rossii* (The role of Leibniz in the establishment of scientific schools in Russia). *Uspekhi fizicheskikh nauk* (Advances in Physical Sciences) 94 (1(2)). Reprinted in: *Uspekhi fizicheskikh nauk* (Advances in Physical Sciences) 169 (12), 1999, 1329–1331 (in Russian).
- Antonova, O., Miloslavov, A., Sokhor, T., 2001. *Logika: biobibliograficheskii spravochnik* (Rossiya SSSR Rossiya) (Logic. A Biobibliographical Directory. (Russia USSR Russia)). Science, St. Petersburg (in Russian).
- Bazhanov, V.A., 2007. *Istoriya logiki v Rossii i SSSR* (History of Logic in Russia and the USSR (Conceptual Context of University Philosophy)). Kanon, Moscow (in Russian).
- Bazhanov, V.A., 2012a. *Vstupitel’naya stat’ya* (Introductory paper). In: Karinskii, M.I., Ivanovskii, V.N., Vasil’ev, N.A. (Eds.), *Logiko-gnoseologicheskoe napravlenie v otechestvennoi filosofii* (pervaya polovina XX veka) (The Logico-Gnoseological Direction in Russian Philosophy (First Half of the XX Century)). Russian Political Encyclopedia (ROSSPEN), Moscow, pp. 5–14 (in Russian).
- Bazhanov, V.A., 2012b. *N.A. Vasil’ev kak chelovek i myslitel’*. *Otkrytie i sud’ba voobrazhaemoi logiki* (N.A. Vasil’ev as a man and a thinker. The discovery and destiny of the imaginary logic). In: Karinskii, M.I., Ivanovskii, V.N., Vasil’ev, N.A. (Eds.), *Logiko-gnoseologicheskoe napravlenie v otechestvennoi filosofii* (pervaya polovina XX veka) (The Logico-Gnoseological Direction in Russian Philosophy (First Half of XX Century)). Russian Political Encyclopedia (ROSSPEN), Moscow, pp. 267–408 (in Russian).
- Bobrov, E.A., 1912. *Geneticheskaya logika* (O knige I.I. Yagodinskogo “Geneticheskii metod v logike”. Kazan’, 1909). *Iz sbornika uchebno-literaturnogo obshchestva pri Imperatorskom Yur’evskom Universitete* (Genetic Logic. (On the I.I. Yagodinsky’s Book “Genetic Method in Logic”. Kazan’, 1909). From Collected Papers of the Educational-Literary Society at the Emperor’s Yur’ev University), vol. 19. K. Mattisen’s Printing Press, pp. 61–80 (in Russian).
- Bobrov, E.A., 1913. *Istoricheskoe vvedenie v logiku* (A Historical Introduction to Logic). Printing Press of the Warsaw School District, Warsaw (in Russian).
- Bobylin, V.V., 1886. *Opyty matematicheskogo izlozheniya logiki* (Essays on the Mathematical Exposition of Logic). Issue 1 (1886). Moscow, edition of the editorial board of the journal “Physico-mathematical sciences in their present and past”, printing press of A.I. Mamontov and Co. Issue 2 (1894). Moscow, partnership of the printing press of A.I. Mamontov (in Russian).
- Bugaev, N.V., 1898. *Matematika i nauchno-filosofskoe mirosozertsanie* (Referat, pročitannyi v Psikhologicheskom o-ve 17 oktyabrya 1898 g.) (Mathematics and the Scientifico-Philosophic Worldview (A Compendium Read at the Psychological Society on 17th October 1898)). Printing Press and Lithography of the Partnership of I.N. Kushner and Co., Moscow (in Russian).
- Chelpanov, G.I., 1906. *Uchebnik logiki* (dlya gimnazii i samoobrazovaniya) (Textbook in Logic (For Gymnasium and Self-Education)), 2nd ed. I.A. Rozov, Kiev–Odessa (in Russian).
- Euler, L., 1770. *Lettres à une Princesse d’Allemagne sur divers sujets de Physique et de Philosophie*. Tome second. A Mietau et Leipsic, Chez Steidel et Compagnie.

- Fakchiolat, I., 1794. *Fakchiolata Iakova Logiki, soderzhashchie nachala logicheskie, v pol'zu obuchayushchegosya yunoshestva*. Per. s latinskogo (Iakov Fakchiolat's Logic, including basics of logic, to the good of student youth. Transl. from Latin). Printing Press of A. Reshetnikov, Moscow (in Russian).
- Groth, N.Ya., 1882. *K voprosu o reforme logiki. Opyt novoi teorii umstvennykh protsessov* (On the issue of a reform of logic. An essay of new theory of mental processes). Historico-Philological Institute, Nezhin (in Russian).
- ICM1, 1898. *Verhandlungen des ersten internationalen Mathematiker-Kongresses in Zürich vom 9 bis 11. August 1897*. Herausgegeben von Dr. Ferdinand Rudio professor am eidgenössischen Polytechnikum. Druck und Verlag von B.G. Teubner, Leipzig.
- ICM2, 1902. *Compte Rendu du Deuxième Congrès International Des Mathématiciens, tenu à Paris du 6 à 12 aout 1900*. Procès-Verbaux et Communications publiés par E. Duporcq, Ingénieur des Télégraphes, Secrétaire général du Congrès. Gauthier-Villars, Imprimeur-Libraire du Bureau des longitudes, de l'Ecole Polytechnique, Paris.
- Infeld, L., 1978. *Whom the Gods Love. The Story of Evariste Galois*. Classics in Mathematical Education, vol. 7. National Council of Teachers of Mathematics, USA.
- IPhC1, 1900. *Premier congrès international de philosophie. La Revue de Métaphysique et de Morale* (1900). Paris, Hachette et cie, pp. 503–698.
- Izotov, G.E., 1993. *Legendy i deistvitel'nost' v biografii N.I. Lobachevskogo* (Legends and reality in the biography of N.I. Lobachevsky). *Priroda* (Nature) 7, 4–11 (in Russian).
- Kapterev, P.F., 1880. *Istoriya Logiki. Lektsii. Pedagogicheskie zhenskije kursy 1879–1880 uch.g.* (History of Logic. Lectures. Pedagogical Courses for Women, year 1879–1880). Kurochkin's Russian Lithography, St. Petersburg (in Russian).
- Karinskii, M.I., 1873. *Kriticheskii obzor poslednego perioda germanskoj filosofii* (A Critical Survey of the Latest Period of German Philosophy). Printing Press of the Department of Udely, St. Petersburg (in Russian).
- Karinskii, M.I., 1880. *Klassifikatsiya vyvodov* (Classification of Deductions). Printing Press of F.G. Eleonsky and Co., St. Petersburg (in Russian).
- Karinskii, M.I., 1890. *Beskonechnoe Anaksimandra* (The Infinity of Anaximander). Printing Press of V.I. Balashev, St. Petersburg (in Russian).
- Karinskii, M.I., 1893. *Ob istinah samoochevidnyh* (On self-evident truths). *St. Petersburg, The Journal of Ministry of Education* 285, 295–354, 286, 450–498, 288, 431–516 (in Russian).
- Karpov, V.N., 1856. *Sistematicheskoe izlozhenie logiki* (A Systematic Exposition of Logic). Printing Press of Ya. Trey, St. Petersburg (in Russian).
- Khrapovtskii, A., et al., 1918. *Polugodovschina so dnya konchiny prof. Petrogradskoi DA M.I. Karinskogo* (In memoriam of M.I. Karinskii, Prof. at the Petrograd Theological Academy, to the half-a-year anniversary of his demise). *Pribavlenie k Tserkovnym Vedomostyam* (Supplement to the Church Minutes) 11/12, 405–408 (in Russian).
- Kolchinskii, E.I. (Ed.), 2003. *Nauka i krizisy. Istoriko-sravnitel'nye ocherki* (Science and Crises. Historico-Comparative Essays). Dmitrii Bulanin, St. Petersburg (in Russian). Composed and edited by E.I. Kolchinskii.
- Lange, N.N., 1898. *Uchebnik logiki* (Textbook of Logic). E.P. Raspopov, Odessa (in Russian).
- Lapshin, I.I., 1917. *Gnoseologicheskie issledovaniya*. Vyp. 1-i. *Logika otnoshenii i sillogizm*. (Po povodu knig privatdotsenta S.I. Povarnina: "Logika. Obshchee uchenie o dokazatel'stve" i "Logika otnoshenii") (Gnoseological studies. Issue 1-i. Logic of relations and syllogism. (On the privat-dotsent S.I. Povarnin's books "Logic. General doctrine of proof" and "Logic of relations"))). Senate Printing Press, Petrograd (in Russian).
- Leikfel'd, P.E., 1890. *Razlichnye napravleniya v logike i osnovnye zadachi etoi nauki* (Different Trends in Logic and Main Problems of this Science). Printing Press of the Governor's Office, Khar'kov (in Russian).
- Lobatschewsky, N.I., 1840. *Geometrische Untersuchungen zur Theorie der Parallellinien*. G. Fincke, Berlin.
- Lobachevskii, N.I., 1945. *Geometricheskie issledovaniya po teorii parallel'nykh linii*. *Perevod, kommentarii, vstupil'nye stat'i i primechaniya* professora V.F. Kagana (Geometrical Investigations on the Theory of Parallel Lines. Translation, Comments, Introductory Papers and Notes by Professor V.F. Kagan). Editions of the Academy of Sciences of the USSR, Moscow–Leningrad (in Russian).
- Lodii, P., 1815. *Logicheskie nastavleniya, rukovodstvuyushchie k poznaniyu i razlicheniyu istinnogo ot lozhnogo*. V pol'zu studentov Sankt-Peterburgskogo Pedagogicheskogo Instituta, sochinennye onogo Instituta Ordinarnym Professorom, Slovesnykh iskusstv i Filosofii Doktorom, Kollezhskim Sovetnikom Petrom Lodiem (Logical Instructions, Directing to Understanding and Discerning the True and the False. To the Good of the Students of

- Saint Petersburg Pedagogical Institute, Composed by the Ordinary Professor, Doctor of Rhetoric and Philosophy, Collegiate Councilor Petr Lodii). Printing Press of Ios. Ioannesov, St. Petersburg (in Russian).
- Losskii, N.O., 1904. *Lektsii po logike, chitannye na 1 kurse Zhenskogo Pedagogicheskogo instituta v 1903–1904 gg.* (Lectures on logic given to the 1st year of the Pedagogical Institute for Women in 1903–1904). The Pedagogical Institute for Women, St. Petersburg (in Russian).
- Losskii, N.O., 1908. *Sbornik elementarnykh uprazhnenii po logike* (Collection of Elementary Exercises in Logic). Printing Press of M.M. Stasyulevich, St.-Petersburg (in Russian).
- Makovel'skii, A.O., 1967. *Istoriya logiki* (History of Logic). Science, Moscow (in Russian).
- Mendeleev, I.D., 1913. *Metod matematiki. Logika i gnoseologiya matematiki* (Method of Mathematics. The Logic and Gnoseology of Mathematics). Education, St. Petersburg (in Russian).
- Mendeleev, I.D., 1914. *Ot krititsizma k eticheskoi gnoseologii. Oproverzhenie krititsizma prof. A.I. Vvedenskogo. Vvedenie v eticheskuyu gnoseologiyu* (From Criticism to Ethical Gnoseology. A Refutation of the Criticism by Prof. A.I. Vvedensky. Introduction to Ethical Gnoseology). Printing Press of br. V. and G. Lukoshkov, Klin (in Russian).
- Motchul'skii, I., 1789. *Logika i ritorika dlya dvoryan* (Logic and Rhetoric for Noblemen). Ponomarev's Printing Press, Moscow (in Russian).
- Mumenthaler, R., 1996. *Im Paradies der Gelehrten: Schweizer Wissenschaftler im Zarenreich (1725–1917)*. Hans Rohr Verlag, Zürich.
- Novitskii, O., 1841. *Rukovodstvo k logike sostavlennoe ordinarnym prof. Univer. Sv. Vladimira Orestom Novitskim* (Instruction in Logic Composed by Ordinary Professor of St. Vladimir University Orest Novitsky). University Printing Press, Kiev (in Russian).
- Orlova, N.Kh., 2016. "My sporili dolgo – do slez napryagenia..." (Nauchnaya polemika rossiiskih logikov na strantsakh otkrytoi pechati v nachale XX veka) ("We argued a long time – up to the tears of stress..." (Scientific controversy in the community of Russian logicians on the pages of public press in the early 20th century)). *Uchenye Zapiski Kazanskogo Universiteta (Seriya Gumanitarnye Nauki)* 158 (4), 1173–1184 (in Russian).
- Orlova, N.Kh., Soloviev, S.V., 2016. *Iz istorii logiki v dorevolutsionnoi Rossii: strategii akademicheskogo vzaimodeistviya* (On the history of logic in Russia before revolution: strategies of academic interaction). *Logicheskie Issledovaniya (Logical Investigations)* 22 (2), 123–154 (in Russian).
- Pervouchine, I.M., 1896. Concerning arithmetical operations involving large numbers. In: *Mathematical Papers Read at the International Mathematical Congress Held in Connection with the World's Columbian Exposition Chicago 1893*. Edited by the Committee of the Congress: Hastings Moore, E., Bolza, Oscar, Maschke, Heinrich, White, Henry S. Macmillan and Co for Amer. Math. Society, New York.
- Poretskii, P.S., 1884. *O sposobakh resheniya logicheskikh ravenstv i ob obratnom sposobe matematicheskoi logiki* (Opyt postroeniya polnoi i obshchedostupnoi material'noi teorii umozaklyuchenii nad kachestvennymi formami) (On Methods of Solution of Logical Equalities and on Inverse Method in Mathematical Logic (An Essay of Construction of a Complete and Accessible Material Theory of Reasoning with Qualitative Forms)). V.M. Klyuchnikov's Printing Press, Kazan (in Russian).
- Poretsky, P.S., 1899. *Sept lois fondamentales de la théorie des égalités logiques*. Emperor's University Printing Press and Lithography, Kazan.
- Poretsky, P.S., 1900. *Exposé élémentaire de la théorie des égalités logiques à deux termes a et b*. *Revue de Métaphysique et de Morale* 1900, 169–188.
- Poretsky, P.S., 1901. *Théorie des égalités logiques à trois termes*. In: *Bibliothèque du Congrès International de Philosophie, III*. Librairie Armand Colin, Paris, pp. 201–235.
- Poretsky, P.S., 1902a. *Quelques lois ultérieures de la théorie des égalités logiques*. Emperor's University Printing Press and Lithography, Kazan.
- Poretsky, P.S., 1902b. *Iz oblasti matematicheskoi logiki* (From the Domain of Mathematical Logic). Partnership of A.I. Mamontov's Printing Press, Moscow (in Russian).
- Povarnin, S.I., 1918. *Disput: o teorii i praktike disputa* (Dispute: on the Theory and Practice of Dispute). O. Bogdanova Editions, Petrograd (in Russian).
- Povarnin, S.I., 1911. *Ob "intuitivisme" Losskogo* (On Losskii's "Intuitivism"). Printing Press of the Association of Printing and Edition "Trud", St. Petersburg (in Russian).
- Radlov, E.L., 1880. *Logika. Lektsii* (Logic. Lectures). M. Dabizh Editions, St. Petersburg (in Russian).

- Raikovskii, A.I., 1857. Logika, sostavlenaya protopriem A. Raikovskim (Logic, Composed by Archpriest A. Raikovsky). I.I. Glazunov and Co. Printing Press, St. Petersburg. Part 1 (in Russian).
- Rizhskii, I., 1790. Umoslovie ili umstvennaya filosofiya, napisannaya v S.-Peterburgskom gornom uchilishche v pol'zu obuchayushchegosya v nem yunoshestva Ivanom Rizhskim (Reasoning or Mental Philosophy, Written at the St. Petersburg School of Mines to the Good of Youth that Study There by Ivan Rizhsky). The School of Mines Press, St. Petersburg (in Russian).
- Rutkovskii, L.V., 1888. Osnovnye tipy umozaklyuchenii (Main Types of Reasoning). Press and Lithography of A.E. Landau, St. Petersburg (in Russian).
- Soulié, S., 2014. La Revue de métaphysique et de morale et les congrès internationaux de philosophie (1900–1914): une contribution à la construction d'une Internationale philosophique. *Revue de métaphysique et de morale* 84 (4), 467–481.
- Stieda, W., 1932. Johann Albrecht Euler in seinen Briefen 1766–1790. Ein Beitrag Zur Geschichte der Kaiserlichen Akademie der Wissenschaften in St. Petersburg. *Berichte über die Verhandlungen etc.* 84 (3), 5–62.
- Struve, G.E., 1900. Elementarnaya logika. Rukovodstvo dlya prepodavaniya v srednikh uchebnykh zavedeniyakh i dlya samoobucheniya (Elementary Logic. Instruction for Teaching at Secondary Educational Institutions and for Self-Education). Newspaper “Vek”'s Printing Press, Warsaw (in Russian).
- Svetilin, A.E., 1882. Konspekt lektzii po logike, chitannykh v SPb. Dukh. Akademii A.E. Svetilinym v 1881–1882 (Lecture Notes in Logic, Read at the SPb Theolog. Academy by A.E. Svetilin in 1881–1882). St.-Petersburg. Manuscript (in Russian).
- Troitskii, M.M., 1886. Uchebnik logiki s podrobnymi ukazaniyami na istoriyu etoi nauki v Rossii i drugikh stranakh (Textbook in Logic with Detailed Notes on History of this Science in Russia and Other Countries), 2nd ed. E. Lissner's and Yu. Roman's Press, Moscow (in Russian).
- Vasil'ev, N.A., 1989. Izbrannye trudy (Selected Works). Science, Moscow (in Russian).
- Vasil'ev, N.A., 1913. Logika i metalogika (Logic and metalogic). *Logos* 1–2, 53–81 (in Russian).
- Vladislavlev, M.I., 1872. Logika. Obozrenie induktivnykh i deduktivnykh priemov myshleniya i istoricheskie ocherki: logiki Aristotelya, skholasticheskoi dialektiki, logiki formal'noi i induktivnoi (Logic. A Survey of Inductive and Deductive Methods of Thought and Historical Outlines: of the Logic of Aristotle, Scholastic Dialectic, Formal and Inductive Logic). V. Demakov's Printing Press, St. Petersburg (in Russian).
- Vvedenskii, A.I., 1909. Logika, kak chast' teorii poznaniya (Logic as Part of the Theory of Knowledge). The Higher Historico-Literary and Law Courses for Women, St. Petersburg (in Russian).
- Yagodinskii, I.I., 1909. Geneticheskii metod v logike (Genetic Method in Logic). Emperor's University Printing Press and Lithography, Kazan (in Russian).