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**RUSSIAN MATHEMATICS TEACHERS: beginnings<sup>1</sup>**

**FORMAÇÃO DE PROFESSORES DE MATEMÁTICA RUSSOS: o início**

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**ABSTRACT**

This article is devoted to the formation of mathematics education in Russia. Although first-rate mathematicians were working in Russia as early as the first half of the eighteenth century (Euler, to name one), nothing close to mass-scale teacher preparation existed. Almost one hundred years had to pass until such preparation came into being. This article, based on archival materials, analyzes certain biographies of mathematics teachers of the eighteenth and early nineteenth centuries, examines how they themselves acquired their education, and discusses certain episodes from their careers.

**Keywords:** Russia. Teacher preparation. Biographies. Mathematics. Education. Traveling abroad In Mathematics education.

**RESUMO**

Este artigo é dedicado à formação da educação matemática na Rússia. Embora matemáticos de primeira linha estivessem trabalhando na Rússia já na primeira metade do século XVIII (Euler, para citar um), não existia nada próximo da preparação de professores em larga escala. Quase cem anos se passaram até que tal preparação surgisse. Este artigo, baseado em materiais de arquivo, analisa algumas biografias de professores de matemática do século XVIII e início do século XIX, examina como eles próprios adquiriram sua educação e discute alguns episódios de suas carreiras.

**Palavras chave:** Rússia. Formação de professores. Biografias. Matemática. Educação. Viagens ao exterior na Educação Matemática.

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## INTRODUCTION

The reforms of Peter I gave rise to a need for the systematic teaching of mathematics and thus for mathematics teachers. Leonty Magnitsky, the famous author of the *Arithmetic*, who collaborated with invited English educators at the School of Mathematics and Navigation, which opened in 1701, should probably be regarded as the first Russian teacher of mathematics (Prudnikov, 1956). Over a hundred years had to pass, however, before the profession of the mathematics teacher who taught a relatively advanced course and not just the fundamentals of counting achieved any currency and some system of teacher preparation was established. Prudnikov (1956) has provided detailed biographies of a number of figures in mathematics education from this period. Below, we will attempt to trace the biographies of certain other individuals, including individuals who were not particularly exceptional, but whose lives were typical and representative.

### 1. THE FIRST DECADES

An image of the mathematics teacher of the 1730s emerges from the pages of the memoirs of the artillery officer M. V. Danilov (1913), who was born in 1722. A future artillery officer was required to study mathematics and Danilov had obtained, by the standards of the age, a quite complete education in mathematics. Danilov describes his teacher—a certain Alabushev—who was sent to teach at his school while he was under suspicion for murder. Alabushev was “a man who, although he knew something, went over Magnitsky’s printed arithmetic and demonstrated some of the geometrical figures to the students, and for this reason presented himself as a learned man, and yet was a quarrelsome drunkard<sup>3</sup>” (p. 23). However, later one more teacher appeared at the school, who finally “put things at the school into better order.” It must therefore be noted that Danilov was undoubtedly lucky—he himself relates how he taught arithmetic to those who had not been taught anything in school.

Where Alabushev received his education is not clear, just as much is unclear about Magnitsky himself. It may be supposed that these individuals learned much on their own. Subsequently, however, future teachers could, at least to some degree, learn mathematics at military schools or sometimes even abroad. An example of the latter may be found in the

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<sup>3</sup> All translations from Russian are by the author.

remarkable biography of Prokhor Suvorov (1750-1815).

The son of a priest, from 1758 to 1765 Suvorov attended the Tver seminary. At this time, Catherine II decided to send a group of students to England to study the sciences. Suvorov was among those who were sent and with great difficulties—financial ones, as well as those connected with his lack of knowledge of English—he pursued a course of study at Oxford, where he was ultimately granted a master’s degree (Alexandrenko, 1893). Subsequently, upon his return to Russia, Suvorov taught a whole series of subjects, from mathematics to the English language, at the Navy Cadet Corps; then he worked at the navigational school in Nikolayev; and he ended his career as professor of mathematics at Moscow University (*Biografichesky slovar’*, 1855). Interestingly, Suvorov was possibly the author (with Vasily Nikitin) of the first Russian book on mathematics translated (by them) into English: “Plane and Spherical Trigonometry.”

The well-known Russian mathematician Semyon Guryev offers an example of a different way of obtaining an education. Born in 1764 into a poor noble family, he enrolled in the Engineering-Artillery Noble Cadet Corps, where he stayed on, after graduating, as a mathematics tutor (Guryev’s teacher N. V. Vereschagin also received his mathematics education at the artillery school). He did also travel abroad, but only later, in 1792, as tutor to the son of Admiral V. Ya. Chichagov, subsequently also an admiral. Interestingly, Guryev and Chichagov-the-younger apparently found nothing new abroad since they had already learned everything from books at home (Prudnikov, 1956, p. 149).

The systematic preparation of teachers began, however, only when Fyodor Yankovich de Mirijevo (Jankovic Mirijevski), a pedagogue of Serbian origin invited to Russia from Austria, organized a system of schools in the country, and organized teacher preparation at the Chief Public School in St. Petersburg. The Teachers’ Seminary, which opened on his watch in 1783, paved the way for the future, subsequently being renamed and reorganized into the Teachers’ Gymnasium, the Pedagogical Institute, the Chief Pedagogical Institute, and finally, the University (Zyablovsky, 1833; Voronov, 1858).

## 2. ABOUT MATVEY REZANOV

It was this Teachers' seminary that counted among its graduates Matvey Yemelyanovich Rezanov, who subsequently became professor of mathematics at the Pedagogical Institute. In his service record we read:

From 1 September 1775 until 7 November 1783, Rezanov studied Latin and Greek, poetry, rhetoric, philosophy, and theology at the Kharkov Collegium, and from 1 January 1784 until 1 August 1786, he studied pure and applied mathematics, physics, geography, universal and natural history, drawing, and German at the former St. Petersburg Teachers' Gymnasium. From 1 August 1786 until 20 July 1788, Rezanov taught Russian literature, arithmetic, algebra, geometry, plane trigonometry, mechanics, physics, civil architecture, Latin, and gave public lectures in physics at the Chief Public School in St. Petersburg. From 22 September of the same year, 1788, until 1 January 1802, Rezanov not only taught all the aforementioned subjects, including physics, but also double-entry bookkeeping, and sometimes fortifications and artillery, spherical trigonometry, conic sections, and modern algebra at the Chief Public School in Astrakhan (O prisvoenii, 1805, p. 12).

In 1803, Rezanov moved to the St. Petersburg Teachers' Gymnasium, where he remained until 1816, when he retired as Ordinary Professor of the Pedagogical Institute. At the same time, he also taught at the First Cadet Corps and gave public lectures at the institute to civil servants. The following memo written by him shows what courses he taught to students and young officials at the Pedagogical Institute:

During this year of 1810, on Mondays and Fridays from 10 a.m. to 12 p.m., Matvey Rezanov, professor of pure and applied mathematics, will instruct the students of the Pedagogical Institute in other disciplines related to Applied Mathematics, which they have not yet received instruction in, namely, Astronomy; Mathematical Geography, using the rules of spherical trigonometry to solve problems in this field, and demonstrating the advantages of such solutions over insufficient solutions of such problems on globes; Chronology; Gnomonics; and the foundations or essence of Civil Architecture, Fortifications, and Artillery; all the while engaging the students from time to time in the review of disciplines already taught by him to them in the year of 1809, these last also related to Applied Mathematics, namely, Mechanics, Hydrostatics, Aerometrics, Hydraulics, Optics, Perspective with a section on Projections, Catoptrics and Dioptrics, and consequently also all of Pure Mathematics, which constitutes the foundation of all of the aforementioned disciplines and was taught by him to students already in 1807 and 1808 as Arithmetic, Algebra, Geometry, plane and spherical Trigonometry, conic sections, and higher or Differential and Integral calculus; and from April 1 to November 1 of the same year 1810, excluding the vacation month of July, on Mondays and Thursdays from 2 to 3 o'clock in the afternoon, Professor Rezanov will instruct young officials, who are professionally required to study these subjects, in the Pure mathematical disciplines of Arithmetic, Algebra, Geometry, plane and linear Trigonometry and other disciplines insofar as he will have time to teach them (Professora Rezanova plan, 1810).

At the same time, Rezanov believed that there should be more mathematics at the Institute. At least he proposed to teach mathematics not only to students in the physics-mathematics department, but to all others as well, explaining that students had much free time, and that moreover they would have to study and subsequently teach "financial and Bruce's accounting, and consequently Italian double-entry bookkeeping, which [cannot be done]

without a deep knowledge of at least arithmetic,” while the students have absolutely no knowledge of it (“I greatly fear,” he wrote, “lest in time this should be attributed to a lack of effort and oversight on my part, and that consequently I should suffer for it though I be guiltless”). (O predlozhenii professor Rezanova, 1805, p. 2)

Rezanov himself, as far as we can judge, had been taught mathematics by Mikhail Golovin, a nephew of the eminent Russian scientist Lomonosov, who had arranged for Golovin to study at the Academic Gymnasium; subsequently, Golovin also studied with Euler. By contrast with Golovin’s other student at the same Teachers’ Seminary—Timofey Osipovsky, who taught at first in this school and then at Kharkov University—Rezanov cannot be regarded as a mathematician of any stature. Moreover, Semyon Guryev, who was mentioned above, even got into a conflict on account of Rezanov with the then-president of the Academy of Sciences and supervisor of the St. Petersburg District, Novoseltsev.

Invited in March 1806 to attend an exam at the Pedagogical Institute, Guryev pointed out that the “proofs employed by Mr. Rezanov in teaching students mathematics are not sound,” in response to which “Mr. President and Supervisor remarked that he knows mathematics and, understanding all that is being asked, finds it to be optimal.” Guryev further wrote in his complaint that “Mr. President and Supervisor berated me as a fool and poorly brought-up person;... and accused me of allegedly posing questions due to my dislike of Mr. Rezanov.” Guryev explained that he had been guided “in posing questions and making observations to students by a single motive—the motive of concern for his fatherland” (Guryev, 1806, p. 1). However, he did not conceal that in reviewing a composition of Rezanov’s in 1800, “he found views in it that were wholly contrary to reason,” (p. 2) and that he regarded Rezanov himself as a deranged person.

Rezanov clearly considered himself to be under-appreciated, and therefore already at the end of his career he sent the following letter to the Conference of the Institute (its governing body):

... having now spent 28 years working in the physical-mathematical disciplines with that tireless diligence which I owe to my natural inclination and love for them, with God's help I have at different times made not a few extraordinarily important, entirely new, extremely remarkable, and altogether unheard-of discoveries both in pure and applied mathematics, which can, I may boldly say, give to Russia and to the Monarch and Leadership whose concern is its welfare a reputed and immortal glory, for which reason I now impatiently wish to present a thoroughly detailed and wide-ranging dissertation about these discoveries at the imperial Academy of Sciences or at the Pedagogical Institute in the presence of My Lords the Academicians and other learned men present here, being prepared to defend it against all objections. In consequence of which I beg this Conference to convey this letter through My Lord the Trustee to My Lord the Minister of Public Education, and to solicit from the latter a directive to the Academy of Sciences that it, inviting other learned men present here by means of special announcements printed in its publications, deign to undertake the labor of hearing out this my dissertation, subjecting it to all

possible criticism and without the least leniency to me, all the way through to the end, however many meetings this should require, and then to report its dispassionate and due opinion concerning it to His Excellency at its convenience (Po prosheniū professora Rezanova, 1814, p. 1).

The request went through the regular channels and by order of the Minister a special committee was formed that was supposed to give Rezanov a preliminary hearing. By all appearances, however, the committee did not find Rezanov's work to be in the least satisfactory. At least, the directive to form the committee was followed a half year later by a new directive from the Minister to “let it be known to Professor Rezanov of this institute that, from now until ordered otherwise, he must cease to send his mathematical computations for examination to the Committee that was established for this purpose” (Po prosheniū professora Rezanova, 1814, p. 4).

It may be supposed, however, the Rezanov was by no means deranged, but on the contrary had quite a good sense of the reality surrounding him. Amateur verses by him have survived that attest to this fact. Written already in his retirement, they are nevertheless dedicated to an exceptionally useful individual, A. Kh. Benkendorf, subsequently the chief of the gendarmerie and the so-called *Third Department* (in effect, the secret police). The verses are entitled “Song of Gratitude to his Excellency Alexander Khristoforovich Benkendorf from the Sage Matvey Rezanov” and they represent an acrostic—the first letters of the lines spell this title with certain abbreviations (Rezanov, 1822-1825, p. 10). Even so, Rezanov’s salary was smaller than that of some other professors, in particular, professors of foreign backgrounds (Ob uvol’nenii, 1816).

### 3. ABOUT DMITRY CHIZHOV

One of Rezanov's students was D. S. Chizhov, who later became the first dean of the department of physics and mathematics at St. Petersburg University. Chizhov initially attended the Tver seminary, but subsequently enrolled in the Teachers' Gymnasium (Pedagogical Institute), after graduating from which he was sent abroad. He describes his European education in a letter from 1811:

After I completed the course of studies offered at the St. Petersburg Pedagogical Institute, my superiors pleased to send me to foreign lands in June 1808.... Mr. Pfaff, professor of mathematics at the former Helmstadt University, was initially my advisor and supervisor during the 19 months of my stay there... granting me special lessons in further study of the more difficult points of (1) linear and spherical trigonometry, (2) analytic geometry using the method of the ancient as well

as the method of the modern (French) mathematicians, the latter being part of those rapid recent successes in mathematics that have had quite a considerable influence on the other parts of this discipline, (3) algebra with the demonstration of the whole substantive theory of combinations as a new branch of mathematics.... toward which Mr. Pfaff himself contributed quite a great deal, and finally (4) differential calculus, without any study of integral calculus, however, for lack of time (O napravlenii studentov, 1811, p. 134).

Then, Chizhov goes on,

I attended classes at the Collège de France given by Mr. D'Alembert in astronomy, Mr. Lefevre-Gineau in physics, Mr. Lacroix and Mr. Poisson in integral calculus, which last was my main focus for many reasons (p. 135).

After returning from abroad, Chizhov began to teach at the Pedagogical Institute, which in time turned into the University. He himself also taught at a secondary educational institution—the Noble Boarding School at the Pedagogical Institute (Karp, 2007)—but the important point for us is that, from this time on, the preparation of teachers and other mathematically qualified experts became routine.

#### **4. THE CASE OF THE BESTOWAL OF HONORS**

In order to understand the position of the mathematics teacher, the following documented episode will be instructive. In 1823, the Czar's brother Mikhail Pavlovich, who was the head of Russia's artillery, solicited the Ministry of Education at the behest of the overseer of the artillery academies about bestowing honors on two mathematics teachers, Ankudovich and Kushakevich, for their “tireless labors in teaching the sciences at the Academy and facilitating teaching of them by means of their diligence and their knowledge” (O nagrazhdenii uchiteley, 1823, p. 1).

After looking into the matter—and both teachers, graduates of the Pedagogical Institute, were only part-time employees at the Artillery Academy and had their principal place of employment elsewhere—Minister Golitsyn replied that one of the teachers had recently received an award while the other one had recently been nominated for an award and was expecting it, and that therefore a bestowal of new honors might arouse grievances from the teachers surrounding them. Mikhail, however, did not let the matter rest, but once more, citing evidence of the achievements of the students of the said teachers, petitioned the Minister to consult the Emperor Alexander I directly on the question. Golitsyn replied that he would certainly do so, and indeed a letter from him shortly followed, in which he reported that “His Imperial Majesty has deigned to instruct me to convey to Your Highness that Ankudovich has

recently been awarded a sign of distinction, while Kushakevich, whom I have already nominated for a sign of distinction to the Committee of My Lords the Ministers, together with other officials of the Ministry mostly highly entrusted to me, should expect an approval from the Committee in the near future” (p. 10).

Mikhail did not argue with the emperor, but when two years later Alexander died, he again submitted a similar request (it is noteworthy that this request was sent at the end of December, 1825—on December 14, an uprising took place in St. Petersburg against the new emperor, Nikolai, and December was occupied by the ensuing investigation and trial, in which Mikhail's role was not the least important, but he still found time to write about the teachers). This time the letter worked. The Minister of Education now did not object, nor did Nikolai deny the request of his younger brother. Each teacher received an award (p. 21). Connections with the military department opened up additional opportunities for a mathematics teacher.

## CONCLUSION

It may be said that it took four generations (Euler-Golovin-Rezanov-Chizhov) for teacher preparation to acquire any kind of firm footing in Russia. Meanwhile, Russians had started writing textbooks much earlier—Golovin wrote them, as did his student Osipovsky. The role of foreign influences is evident. Even after Chizhov, smart mathematics students would often travel abroad in order to complete their studies, in one sense or another (this practice ended completely only with the rigidification of Soviet rule in the early 1930s). With teachers this was, of course, not entirely the case; after the period described, teachers often did not travel anywhere (indeed, even Rezanov already did not study abroad), but the influence of Western literature was very great.

As we can see, religious seminaries were a very important source of new teachers; these institutions offered no mathematics education, but they offered an education in the humanities and, above all, were oriented toward a segment of the population that intended to study and to teach. The ties to military schools should also be emphasized. As we have seen, these institutions produced teachers; but what is even more significant is that they produced a large number of teaching positions, and these positions were connected with the world of military officials, who were the most influential men in Russia. Mathematics was regarded as a kind of military science, which strengthened the position of the subject and its teachers.

Finally, the position of the mathematics teacher during this period presents a point of



interest. As we can see, even a member of the nobility could be publicly insulted, while on the other hand, even a professor did not hesitate to engage in servile flattery. The standards of academic conduct developed very slowly and mainly during later periods.

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