

# Dmitry Chizhov and the examination of mathematics textbooks in Russia during the 1820s-1830s

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## Abstract

*The late 1820s and early 1830s were a time when the requirements placed upon education in Russia became stricter (or in some cases were established), including the requirements placed upon mathematics education. A significant role in this was played by the so-called Committee for the Examination of Textbooks, in which St. Petersburg University Professor Dmitry Chizhov was responsible for mathematics. The present article, which relies on surviving documents, is devoted to Chizhov's work on reviewing existing and planning new textbooks.*

Keywords: mathematics textbooks, Ministry of Education, regularization, Committee for the Organization of Educational Institutions, Committee for the Examination of Textbooks

## Introduction

This article describes the regularization of the requirements placed on mathematics textbooks that occurred in Russia during the 1820s and 1830s. This regularization occurred within the context of a broader regularization and stiffening of the requirements placed on the teaching process in general and in particular on the teaching of mathematics. A certain degree of liberalism, which had until then prevailed in privileged civic educational institutions (gymnasia or boarding schools for the nobility), thanks to which students not wishing to study mathematics were free not to pay too much attention to it, gradually gave way to a more exacting arrangement. The memoirist Nikolai Markevich, who attended the Noble Boarding School from 1817 on, left memoirs in which he vividly described how rude he was to his teacher Dmitry Chizhov, who was unhappy that Markevich was not doing any work. Meanwhile, the head of the St. Petersburg educational authority (and later minister of education) Sergey Uvarov, who, as the same memoirs make clear, visited the Boarding School quite often, sided with Markevich, and not with his teacher (Karp, 2007). Gradually, such a thing became impossible. Emperor Nicholas I was inclined to promote rigid discipline in general; according to surviving archival documents he once ordered that a teacher be dismissed only because a student of his had allowed himself to lean on his elbow in class (Karp, 2015). It was within the context of this “establishment of order” that the government practice of examining textbooks

developed, and not a small part in this development was played by the aforementioned Chizhov, as will be discussed below. The present article is based on materials from the Russian State Historical Archive, which, to the author's knowledge, have not been previously studied<sup>1</sup>.

## On the state of affairs prior to 1826: Legendre's textbook as a case study

In Russia, the role of the government in education had always been considerable. One episode will suffice to illustrate this fact. On October 3, 1810, the academician Semyon Guryev was sent a letter from the Ministry of Education, informing him that "Petrushevsky, Senior Teacher of Physics and Mathematics at the Pskov Gymnasium, has translated Mr. Legendre's Geometry and Trigonometry into the Russian language" (Po predpisaniyu, 1810, p. 1). Guryev was asked to evaluate whether this work deserved "to be published, both in terms of the quality of the book and in terms of the quality of the translation."

Foma Petrushevsky (1785-1848) left his mark on Russian history with his other works as well (Polovtsev, 1902). At a later time, after moving to St. Petersburg, he served as director of a home for destitute children, and after that, as director of the Institute for the Blind. Petrushevsky wrote books on measurement science and translated the works of Euclid and Archimedes, as well as *Traité élémentaire d'arithmétique* [Elementary arithmetic] by Lacroix (which he published in 1817).

The archives contain a draft of the letter to Guryev, which reveals that Petrushevsky's translation was originally going to be sent for review not to him, but to Nicolas Fuss (1755-1825), who had once been Euler's secretary, and who later became a Russian academician and textbook author. Evidently, it was found that inviting Fuss for the role of reviewer presented a certain inconvenience, and this, as we will see, is understandable.

Guryev responded directly to the minister, concisely and point by point. First, he explained that:

Mr. Legendre's work... although in a strict sense it possesses infirmities and deficiencies, for example, in its manner of ordering or arranging the topics, their proofs, the omission of certain rather important ones, and conversely in its inclusion of others that do not at all belong here; nonetheless, this work of a man so well known in the scientific world may be considered, as a whole,

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1 Those interested can find more information about the history of Russian mathematics education as a whole in the book by Karp & Vogeli (2010).

2 All translations from Russian are by the author.

to be one of the good works of this kind that have been published (Po predpisaniyu, 1810, p. 2).

Subsequently, however, he goes on to say that this work assumes that its readers already possess considerable knowledge, and consequently that “it can be useful only for adults and sufficiently prepared young people, not for children” (pp. 2-3). This remark is followed, finally, by his main thought:

It is known that the Main Directorate of Schools<sup>3</sup> is publishing a complete Course in Pure Mathematics by the academician Fuss, which contains also the foundations of geometry, published already in the year '98 in the French language and shortly thereafter in the Russian; which foundations, in my opinion, will be more useful for children than Legendre's, since in terms of their order and even the strictness of their proofs, they are not inferior to the latter, while in terms of brevity and convenience for teaching, they incomparably surpass them (p. 3).

In addition, Guryev discovered flaws in the translation, which made immediate publication impossible. Consequently, Petrushevsky was informed that “he may use his work as he sees fit” (p. 4). Petrushevsky's translation, as far as we know, was never published, while the first Russian edition of Legendre's Geometry appeared only in 1819 (Legendre, 1819), in Matvey Sakharov's translation, having been published, as the book indicated, “for the use of the cadets of the Imperial Military Orphanage.”

This episode just described displays the situation quite clearly: at that time, books were quite expensive, and the publication of a textbook that was not explicitly recommended for use in schools could not come close to paying for itself; consequently, without government support, it would have been difficult to publish a book on geometry (although no one prohibited Petrushevsky from doing so). Certain books were undoubtedly recommended to educational institutions (Fuss's books, for example), but given the shortage of textbooks, on the one hand, and the variety of types of educational institutions, on the other, the latter ended up using a great variety of texts. To repeat, this episode clearly shows that diversity and freedom in the choice of textbooks were not unlimited; nonetheless, the Russian Emperor Nicholas I was not satisfied with the existing state of affairs. In May 1826, he wrote:

“Reviewing with especial attention the organization of the educational institutions in which Russian youth is educated to serve the state, I regret to observe that they lack that necessary and indispensable uniformity which must be the

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3 Main Directorate of Schools (Glavnoe pravlenie uchilishch) – a branch of the Ministry of Education that was responsible at that time for providing textbooks to educational institutions, among other things.

foundation of both child rearing and instruction” (Perepiska, 1826-1828, p. 1<sup>4</sup>).

## **The Committee for the Organization of Educational Institutions and the Committee for the Examination of Textbooks**

The words of Nicholas I quoted above are taken from his rescript to the then-Minister of Education, Shishkov, announcing the formation of a new Committee: the Committee for the Organization of Educational Institutions. The following were listed among the Committee’s objectives:

Article 4. To define in detail all courses of study for the future, indicating likewise the texts that must henceforward be used in the teaching of them.

Article 5. In connection with this, to decide which of the existing texts are good, and also to make arrangements for providing what is missing, selecting to this end the appropriate professors and academicians, subject to Your approval and my confirmation, with a view to proscribing thereafter all arbitrary teaching based on arbitrary books and notes. (Perepiska, 1826-1828, p. 1)

In his reply, Minister Shishkov proposed to form a special Committee for the Examination of Textbooks, which would focus on achieving these two objectives and which would be chaired by one of the members of the Committee for the Organization of Educational Institutions. He also proposed various members as possible candidates. One of these was Dmitry Chizhov, clearly intended to oversee mathematics. In response to this, the Sovereign wrote: “[I am] in complete agreement, but would request that the matter not be delayed, since this sometimes happens with scientists” (p. 3). And the Committee was formed. Long transcripts of the Committee’s meetings have survived, which include materials dealing with the examination of numerous handbooks, written both in Russia and abroad (Perepiska, 1826-1828; Zhurnaly, 1828-1835). The account below is based on these transcripts. But first a few words must be said about Dmitry Chizhov.

## **Dmitry Chizhov**

Dmitry Chizhov (1784-1852) played a significant role in the formation of Russian mathematics education (Karp, 2014). He began his education at the so-called Kashin

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4 The document’s pages were numbered in two ways: including and excluding the table of contents. We find it more convenient to use the second method. According to the first method, this page is number 12.

clerical gymnasium, continued it (beginning in 1792) at the Tver Seminary<sup>5</sup>, and then in 1803 was transferred to the Teachers' Gymnasium (later called the Pedagogical Institute, which subsequently became the basis of St. Petersburg University). After completing his education there in 1807, he, along with a number of the other top students, was sent in 1808 to study abroad, where his teachers included Pfaff during the year and a half that he spent in Germany, and then, in France, D'Alembert, Lefevre-Gineau, Lacroix, and especially Poisson, under whose direction Chizhov studied integral calculus. Upon returning to Russia in 1811, he was appointed adjunct professor at the same Pedagogical University, assisting his former teacher Matvey Rezanov. Later, Chizhov became a professor at this university (whose name in the meantime had changed – the university opened in 1819). At the same time, he also taught at other educational institutions, both at the higher level (Institute of Railway Engineers, Main Engineering Academy) and middle level (at the aforementioned Noble Boarding School). He repeatedly served as dean of the physics and mathematics faculty, becoming a distinguished professor (an honorary title) in 1841. Chizhov was an associate member (from 1826) and a full member (from 1828) of the Imperial Academy of Sciences. He retired in 1846. Chizhov was a recipient of various orders of merit and an actual state councillor (from 1842) (*Ob utverzhdenii*, 1842).

The works and writings that Chizhov left behind are rather few in number, but he clearly devoted a great deal of attention to teaching and administrative work. Thus, for example, among his other functions, he was appointed visitor (as it was then called) to private educational institutions. His duties in this connection were formulated quite clearly: to ascertain whether these institutions met the government's requirements, since "the government must not permit even the existence of such Institutions, if their prevailing orientation is different from the one that the government wishes to give to public education in general" (*O naznachenii*, 1833, p. 4).

He was also sent to government gymnasias. Thus, he attended an exam at the Third Gymnasium in St. Petersburg and punctiliously reported that the title of the father of one of the students was not indicated in the school documents, and that the document lacked an official seal, while another student's certificate had been printed on ordinary rather than watermarked paper and also lacked the proper official seal (*Perepiska popechitelya*, 1831-1835, p. 25).

The Russian Biographical Dictionary (Polovtsev, 1905) notes, however, that in 1821, during what may be described as an ideological purge of the University,

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5 The word "seminary" in different countries and at different times has been used in different senses; thus, it must be noted that, at that time, a "seminary" in Russia was understood to refer to an educational institution at what today would be considered the pre-college level (insofar as such terminology can be used with reference to the eighteenth century at all).

Chizhov was one of the few professors who refused to censure those whom the administration accused of disseminating subversive ideas (the accused included his fellow students from the Pedagogical Institute and his trip abroad).

As a member of the Committee for the Examination of Textbooks, Chizhov regularly reviewed various textbooks – both Russian and foreign, printed or still in manuscript. He also created something like a program for equipping the country with textbooks and facilitated their writing or translation. We will describe these aspects of his work in greater detail.

### Chizhov's textbook reviews

From the surviving documents, it is not clear how it was decided which textbooks should be reviewed. Sometimes the textbooks that had to be reviewed were inaccessible to private individuals, as Chizhov's writes, complaining at the very beginning of his work as a member of the Committee in August 1826 that he was unable to acquire the books printed for the schools of so-called military settlements<sup>6</sup> at their headquarters' printing office and requesting that they be sent to him (Perepiska, 1826-1828, p. 96). One may assume that such difficulties were subsequently ironed out.

It is likely that the books published by the printing office of the military settlements' headquarters that Chizhov had to review included the manual in arithmetic *Uchebnaya kniga* (1825). The archive contains a review of certain arithmetical tables for cantonists<sup>7</sup> based on the monitorial method of education (no more precise information about them exists), and of all known publications, the manual just referred to best matches this description. Chizhov's review of it is indicative of his style: he does not merely provide a discussion of the contents of the book, but considers it more important to express his general opinion. After praising the reviewed book for its gradual approach and clear exposition, he adds:

Indeed, the monitorial method of education in my view can be useful only in the teaching of reading, writing, and the elementary rules of arithmetic, but nothing more. For this method, even with the mechanism and clarity connected with it, while making the study of the aforementioned subjects easier, can constrain the imagination in the study of higher subjects and by doing so hinder its further development (Perepiska, 1826-1828, p. 89).

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6 A form of military organization that existed in Russia during the period 1810–1857, which combined military service with productive labor, first and foremost, agriculture.

7 Cantonists -- students who, due to their origins, were required subsequently to serve in the army (in particular, children of residents of military settlements).

This was by no means the only book on arithmetic reviewed by Chizhov and he was not always so restrained and benevolent. Several years later, for example, he reviewed *New Arithmetic* (Teriukhin, 1827). In this case, he did not mince words:

This book cannot be put into general use as a textbook in schools for the very numerous and pernicious defects with which it is replete. It contains much that does not accord with the subjects addressed in it, which may give rise to false notions among the students. [...] Proofs are either unsatisfactory or not offered at all. [...] I found nothing new, despite the fact that this book is titled 'New'. [...] On the whole, the presentation of the subject is far from comprehensible either for children or for adults (Zhurnaly, 1828-1835, p. 121).

Even here, however, specific observations are few in number; Chizhov writes:

A detailed written analysis would have pointlessly taken up too much time and therefore I have confined myself to notes on the margins in pencil in only a few places in the book.

Indeed, he is not so much a reviewer as a judge, authorized to make decisions, briefly stating his reasons for them.

Chizhov also had to review foreign textbooks. Their selection remains a mystery. It is easy to understand why *Traité élémentaire de statique* [An elementary treatise on statics] by Gaspard Monge attracted attention. Praising it for the clarity of its presentation, Chizhov writes: "in France, this book in general is considered to be the best textbook" (Perepiska, 1826-1828, p. 111). It is far more difficult to understand why it was necessary to discuss the book *Geometrische Anschauungslehre: Eine Vorbereitung zum leichten und gründlichen Studium der Geometrie* [Geometrical apprehension: A preparation for the easy and thorough study of geometry] by Johann Josef Ignaz Hoffmann, published in Mainz in 1818. Schubring (1993) notes that Hoffmann (1777-1866), professor of mathematics in Aschaffenburg, was "quite influential in his own day (though since fallen into oblivion)" (p. 46). And yet, neither Hoffmann himself, nor the aforementioned book, can be placed alongside of the books and authors that were most popular in Western Europe. As it happened, Chizhov did not endorse the book: after discussing the importance of geometry and the difficulties involved in its teaching, he asserted that the book contained too many questions and repetitions, while the tedious details, "instead of arousing the students' attention and interest, can breed revulsion in them" (Perepiska, 1826-1828, p. 110).

In other instances, Chizhov could be more favorable. After finding numerous shortcomings in a book by Kroymann (1807), he nonetheless points out that the book could be taken into consideration in the writing of a similar book in the Russian language, and moreover, that even apart from the writing of such a similar book, the present collection of problems

could be beneficially used in our schools if it were translated into the Russian language and adapted throughout to Russian units of measure. It could especially lighten the work of teachers in collecting problems of this type (Zhurnaly, 1828-1835, p. 146).

In reviewing books, Chizhov not only recommended or did not recommend books for translation and publication, but also assembled lists of books recommended for acquisition by the libraries of gymnasia. Thus, in 1828 he prepared a list of books “indicated in the order of their usefulness for Libraries<sup>8</sup>” (Zhurnaly, 1828-1835, p. 120). The first place on this list is occupied by Bellavène’s course (*Cours de mathématiques: à l’usage des écoles impériales militaires*), the second place by Francoeur’s course (for example, see Francoeur, 1809). It is not clear whether the books being recommended are already existing translations—for example, Bellavène (1824-1825) – or French originals. Then comes the Small Mathematics Encyclopedia [*Ruchnaya matematicheskaya entsiklopediya*] (1826-1827). The fourth place is occupied by Legendre’s *Geometry* (in French), and so on. There were not enough Russian books or even books in Russian. Chizhov’s greatest efforts were aimed at increasing their numbers.

## The planning and preparation of new textbooks

In response to his superiors’ queries, Chizhov submitted opinions, as they were then called, about which books and other teaching manuals were lacking, and which of the existing ones he considered to be the best. The best text for gymnasia, in his opinion, as has already been noted, was the “Course in Pure Mathematics (known under the name of Bellavène), translated from the French, with addenda and published as a textbook for the Artillery Academy” (*Perepiska*, 1826-1828, p. 341). Chizhov proposed republishing this book with certain abridgements and changes (as was subsequently done). At the same time, he quite realistically understood the difficulties connected with the transition to a new textbook, suggesting that until the new books had been introduced, everything should be left as it was, because to change textbooks several times and to buy all of the new books would be difficult for parents without sufficient means. To show the diversity of textbooks in use he lists the books used only in St. Petersburg school district – these include both original Russian textbooks by Fuss and Osipovsky and translated texts by Bellavène

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8 It is noteworthy that Fuss’s books are missing from the list. A “Report by the School Committee of St. Petersburg University” prepared in 1825, in the writing of which Chizhov clearly took part, contains many critical remarks concerning them: concerning Fuss’s book on algebra, the report states that its “arrangement of topics is extremely difficult for students”; concerning his book on geometry, that it is “inadequate in terms of the strictness of its proofs”; and so on (Shmid, 1879, p. 196).

and Lacroix, and much else besides, even including books published in the Polish language (Perepiska, 1826-1828, p. 343).

Somewhat later (in May 1828), Chizhov submitted a more elaborate statement about educational texts “recognized as indispensable for the mathematical sciences” for parish schools, uyezd (district) schools, and gymnasia. For the first of these, he names arithmetical tables (for the monitorial method of education), and for those cases where such tables cannot be used due to the small number of students, he recommends another brief handbook (without giving any specific titles). For uyezd schools, brief handbooks in arithmetic and geometry are called for (again, there are no specific suggestions), as well as various visual aids – as we would say today – and instruments, models for drawing, a compass, an astrolabe, a proportional compass, and so on. To this, Chizhov adds a remark:

As the aim of these schools is to educate children who in time will devote themselves for the most part to the trades and to manufacturing, the methods of education must as far as possible be adapted to this aim.

To this end, he recommends that at least teachers should be able to make use of translated texts by Dupin (1826) or Bergery (1825). Lastly, for gymnasia, Chizhov notes the need for a handbook on the foundations of pure mathematics, and also for instruments, models of machines and geometrical objects, and models for drawing (*Zhurnaly*, 1828-1835, p. 106).

Under Chizhov’s supervision, new textbooks were prepared; he oversaw both the organizational and the methodological sides of the work. The textbooks that probably deserve to be mentioned first are those of Fyodor Busse (1794-1852), written under Chizhov’s supervision (as he himself wrote). Busse prepared textbooks in arithmetic and geometry for uyezd schools and a problem book in arithmetic to complement his textbook (in subsequent decades, these books were reissued – for example, Busse (1829-1830; 1832; 1835)).

Presenting Busse’s problem book in January 1831, Chizhov explained that problems were arranged in it “in the same order as the topics in Textbook in Arithmetic for Uyezd Schools,” published in 1829, and that the collection of problems was modeled on Gremilliet (1826), but in a different order and with different measures, monetary and other units, to adapt them to Russian schools. Chizhov wrote about this book: “I have repeatedly examined it and for my part I approve it for publication, and recommend that the proofreading be assigned to Mr. Busse himself” (*Zhurnaly*, 1828-1835, p. 404).

Chizhov himself explained to his supervisors why one or another delay in publication occurred – “necessitated by the coordination of the parts and the

correspondence (for which Mr. Busse made considerable financial outlays)” – (Zhurnaly, 1828-1835, p. 179) – or kept various financial accounts. In 1831, he wrote:

With the completion of this book, Mr. Busse has successfully carried out all of the instructions of the Committee related to the writing of textbooks by him under my direction and supervision. For this reason, I make so bold as to ask whether it may please Your Excellency to petition the higher authorities for a fitting reward for Mr. Busse for this (not visible, but nonetheless) useful and time-consuming work (Zhurnaly, 1828-1835, p. 404).

Subsequently, he clearly supported a petition to award Busse with the Order of St. Vladimir, fourth degree, for writing the textbooks: “this award would be quite gratifying and precious for him as a token of imperial benevolence and favorable approval on the part of the higher authorities” as it was expressed by Busse himself (Zhurnaly, 1828-1835, p. 409).

Other textbooks were also prepared under Chizhov’s supervision and on his instructions, including, for example, Francoeur’s course (1831), with Chizhov overseeing the disbursement of payment to the translator (about one thousand rubles), and the varnishing of the diagrams, and the changes made in the book (“almost all of the projections have been altered, since the method common among the French is new to [our] teachers”), and determining the book’s intended audience – the book was suited both for uyezd schools and for the lower grades of gymnasia, and the first section can be taught using the monitorial method, while the last section must be taught in the normal fashion “and only to the best and most capable students (whose number undoubtedly will never be very great)” (Zhurnaly, 1828-1835, pp. 236-237).

A new edition of Chizhov’s beloved Bellavène was also prepared, now titled *A Course Composed by A. Ya. Kushakevich and A. S. Kinderev* (for example, 1846). Presenting it, Chizhov wrote on December 27, 1834:

I have the honor of presenting to the Committee the elementary foundations of pure mathematics for use in gymnasia. They contain Arithmetic, elementary Algebra (ending here with second-degree equations and Logarithms). Geometry, Linear Trigonometry, with applications to practical problems and the application of Algebra to Geometry (including conic sections). These foundations have been composed under my direction and supervision by Messrs. Kinderev and Kushakevich, in accordance with the curriculum on this subject approved and confirmed by the Committee for the Organization of Educational Institutions. To this end, the Course in Pure Mathematics by Bellavène, translated by them previously, has now been completely revised and adapted for the needs of gymnasia, with the exception only of Geometry, in which only a very few changes and corrections had to be made.

The elementary foundations of pure mathematics presented here in my view entirely meet the intended purpose (*Zhurnaly*, 1828-1835, p. 782).

The book, however, was met with comments by Professor Perevoschikov of Moscow University, which were forwarded to Chizhov for review. On June 15, 1835, Chizhov reiterated his former opinion, noting, however, that certain alterations would be made in the book in keeping with Perevoschikov's wishes ("elementary continued fractions in the section on arithmetic are not altogether sufficiently demonstrated" – *Zhurnaly*, 1828-1835, p. 802). At a meeting on July 20, 1835, Chizhov's opinion was read out loud; he noted, not without venom, that

Mr. Perevoschikov, evidently wishing merely to indicate which articles in general may be used to expand the various parts of the aforementioned course, in most of his remarks about it had only the completeness of the discipline in view, while paying no attention whatever to the very purpose of such a course. (*Zhurnaly*, 1828-1835, p. 811).

Based on this review,

The committee has resolved to present for further consideration to the Minister of Public Education both the aforementioned manuscript by Messrs. Kushakevich and Kinderev with Mr. Perevoschikov's comments, and the translators' annotations on the latter, while reporting at the same time that this book has been composed in conformity with the required program and with the arrangement of academic subjects that exists in gymnasia, for which reason the Committee adheres to its previously stated opinion regarding it (*Zhurnaly*, 1828-1835, p. 811).

### **Certain general remarks by Chizhov**

Although the present article is devoted specifically to textbooks, it must be pointed out that, while working on the Committee, Chizhov also presented his views on other aspects of teaching mathematics. Among these, we should note the negative opinion submitted by him concerning the extremely inadequate number of hours that were to be allocated for the teaching of mathematics in gymnasia with the Greek language (*Zhurnaly*, 1828-1835, pp. 117-119). Chizhov writes:

Mathematics as a practical and empirical Logic, ever since it has existed, has always and everywhere been recognized as one of the main subjects constituting a sound general education, since by stimulating the power of reasoning and teaching the strictest precision and accuracy in judgments, it thereby facilitates the development of many capabilities in the students. For this reason, it must be taught in a manner worthy of it, and in particular in the upper grades of Gymnasia, that is, thoroughly.

Chizhov then writes that the suggested number of hours for grades 4-7 is absolutely insufficient; that with such a method of teaching in gymnasia, special preparatory classes would need to be introduced for education at the University; and finally, that

there will be even greater difficulty in finding (or teaching) such skillful teachers as would be capable of teaching children in three years that which requires seven, and more hours than what has been allocated, and in such a way that in the remaining 4 years they would not forget anything. These teachers must not teach like professors. They must pay attention and make sure that each pupil has understood the proof offered by him or the problem solved by him, and force pupils to repeat this over and over again.

The decree issued in 1828, however, implemented a significant reduction in the course in mathematics.

The Committee's journals also contain *Model Instructions for Teachers in Schools for the Children of Government Office Workers* (Zhurnaly, 1828-1835, pp. 149-157), one section of which is addressed to teachers of mathematics. Although this document contains no information about its authorship, it may be supposed that Chizhov was among those who participated in its composition or at least in its approval, especially since the views developed in the Instructions are clearly similar to those expressed by him elsewhere:

35. The main efforts of the mathematics teacher must be directed at developing in the pupils, without relying on their memory alone, such power of reasoning as might help them to comprehend on their own the sequential concatenation and origination of mathematical verities. To this end, it is most useful to follow the rule of not passing from one proposition to the next without first convincing the pupils of the truth of the former with a clear and precise proof.

36. Such a method of teaching not only facilitates a fundamental comprehension of the mathematical sciences, but at the same time can be greatly beneficial for the correct formation of the reasoning ability in general, imperceptibly imparting the skill of strictly ordering ideas in speeches and compositions, drawing natural conclusion, and not making false inferences. In short, a skillful Teacher of mathematics can in a certain way replace the teacher of Logic and be an important aid even to the teacher of literature.

## Discussion and conclusion

In December 1834, Chizhov wrote: "I have the honor to report that, as of today, all instructions given to me by the Committee to oversee and direct the adaptation of translations and the composition of textbooks on technical drawing and elementary mathematics for uyezd schools and for gymnasia have been carried out" (Zhurnaly,

1828-1835, p. 782). Naturally, this did not mean that work on ratifying new textbooks stopped: the Committee for the Organization of Educational Institutions was officially terminated only in 1850; but in reality its activities ceased earlier, while the approbation, authorization, and support of new textbooks was carried out both before and after this by various other agencies, until it finally became the purview of the so-called Scientific Committee of the Ministry of Education (Georgievsky, 1902).

It must be emphasized that never prior to the revolution of 1917, let alone during the 1820s-1830s, was such a uniformity achieved as may be remembered by people who were schooled in Soviet times. Kolyagin and Savvina (2013), who disapproved of those deviations from this uniformity that did occur during the 1990s, sarcastically write that the “much-vaunted variety of alternative approaches existed in the nineteenth century as well” (p. 59). In fact, it is likely that the possibility of a lack of alternative approaches simply did not enter anyone’s mind at the time, and what people were troubled by was not an excessive quantity of textbooks, but on the contrary a shortage of good textbooks (or even not such good ones – we should remember that textbooks were quite expensive).

At the same time, one feature that developed at that time and even earlier endured for quite a long time. Chizhov might have been described as the person in charge of mathematics in the country (even though mathematics was taught to only a very small part of its population). His power was not unlimited – those who were in charge of education as a whole were free to ignore, as we have seen, the opinions of lesser authorities. Moreover, other professors (the same Perevoschikov) could disagree with him on certain matters, and he would have to overcome their opinions somehow. However, Chizhov’s position was extremely powerful, and to repeat, such a position – that of the main expert on the teaching of mathematics – emerged again and again over the next hundred and fifty years.

Russian mathematics education developed indissociably from mathematics education abroad; distinctions between them were recognized, but Russian mathematics education was built on the basis of foreign (German and French) mathematics education, and no a priori preference was given to Russian sources.

School mathematics had not yet acquired its clear boundaries at this time; it included a number of topics that later came to be studied in other courses or stopped being studied in school altogether. The teaching of mathematics was viewed as achieving practical goals, on the one hand, but on the other hand, general developmental goals as well--teaching students logic and even serving as an aid to the study of language and literature. In this respect, Chizhov and Russian education adhered to common European norms.

During the 1840s-1860s, more detailed curricula and new textbooks appeared, and later – during the 1880s-1890s, when the number of educational institutions increased still more – a new generation of textbooks and problem books appeared, which became the foundation of Soviet schools as well, and which, while making use of German and French methodological insights, nonetheless were far more oriented toward their own enormous market. This development, which took mathematics education far from what had been accomplished during the 1820s-1830s, was nonetheless based on the crucial steps that had been taken at that time toward the recognition of what school mathematics education needed and the preparation of well-conceived sets of textbooks.

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