‘Universal Responsiveness’ or ‘Splendid Isolation?’ Episodes From the History of Mathematics Education in Russia

Alexander Karp

This article investigates the prevalent attitudes toward foreign influences and methodologies in Russian mathematics education at different periods in Russian history. The words ‘universal responsiveness’ belong to Dostoevsky, who, in his famous speech on Pushkin, used them to characterize Pushkin’s openness to the genius of all other nations. Moreover, Dostoevsky considered universal responsiveness to be typical of Russians in general. However, the isolationist tradition in Russia has been no less influential. At times this tradition has prevailed, at times it has retreated. It has expressed itself openly in political life – Stalin’s campaign against ‘cosmopolites’ was an especially striking example – and its impact on the development of literature and science has been the object of extensive research. Mathematics education, however, has rarely been looked at from this perspective. This paper will focus on a few select episodes from the history of mathematics education in Russia. These episodes, however, clearly demonstrate that a conflict between the isolationist and the internationalist traditions has taken place in this field as well. The paper contains a discussion of Leo Tolstoy’s article ‘On the People’s Education’, little-known in the West, in which Russian mathematics education is aggressively and favorably contrasted with German methodologies. It also examines a methodological work from 1951, which includes a chapter entitled ‘From the History of the Struggle against Foreign Influences in Russian Mathematics’. On the other hand, the article also looks at materials from Russian mathematics teachers’ congresses from before the Russian Revolution, which illustrate Russian involvement and participation in processes taking place abroad. It also analyzes correspondence between the well-known Russian and American mathematics educators Dmitry Sintsov and David Eugene Smith, discovered by the author, which facilitates a deeper understanding of certain aspects of the issues under investigation.

Introduction

The Iron Curtain that separated Russia from the West is supposed to have fallen almost 15 years ago. Yet Russian mathematics education remains effectively cut off from the West to this day. An American or even a geographically closer German
A. Karp

mathematics educator usually has a rather vague conception of what is taking place in mathematics education in Russia, just as the Russian mathematics educator has little notion of what is going on abroad. There was a time, however, when Russian intellectuals considered openness to be a unique characteristic of Russian culture. The words ‘universal responsiveness’ belong to Dostoevsky, who, in his famous speech on Pushkin, used them to characterize Pushkin’s work. Dostoevsky considered Pushkin’s ability to ‘embody with such power the genius of another nation’ to be not just the writer’s own peculiar gift but one that was typical of Russians in general. Russian culture has indeed absorbed a great deal from abroad, and for this reason it has preserved a sense of kinship with the sources that have nourished it.

The Russian relation to the foreign, however, has never been simple. The cultural historian Boris Uspensky has written about the specific phenomenon of the Russian intelligentsia, which took shape around the middle of the nineteenth century, and the internationalizing spirit that was as characteristic of it as its humanist and revolutionary tendencies; according to Uspensky, this cosmopolitan spirit represented a (negative) reflection of the official ideological position, which included nationalism along with Russian Orthodox Christianity and autocracy (‘nationalism’ understood as a conspicuous preference for the Russian over the western).

The isolationist tradition has existed in Russia alongside the internationalist one, at times prevailing, at times retreating. It has expressed itself openly in political life (Stalin’s campaign against ‘cosmopolites’ was an especially striking example). Its impact on the development of literature and science has been the object of extensive research. Mathematics education, however, has rarely been looked at from this perspective. In this paper, I will attempt to trace the development of Russian mathematics education in terms of its interaction with developments abroad. I will be constrained to limit myself to several episodes from the history of mathematics education in Russia. These episodes, however, clearly demonstrate that a conflict between the isolationist and the internationalist traditions has taken place in this field as well.

The Pre-Revolutionary Period

The birth of mathematics education in Russia (at least in modern times) can probably be dated from the founding of the ‘School of Mathematics and Navigation’ by Peter I in 1701. Prior to this, mathematics in Russia existed only in an embryonic state.

And what is there to say about arithmetic, geometry, and other mathematical arts, which Russian children today learn eagerly, master gladly, and demonstrate in a praiseworthy

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3 Ibid., 145. Here and below, all translations are by the author.
fashion – was anything like this seen previously?’ – this rhetorical question was posed by the speaker who delivered the famous eulogy after Peter’s death. ‘I know not whether in the whole land there was a single compass’, the orator continued. ‘The names of other instruments were not even known. And if someone had used a technique of arithmetic or geometry, it would have been considered magic’.6

British instructors were invited to teach at the school, and it was they who in fact laid the foundations for the study of mathematics in Russia, among other things preparing the first instruction manuals. Leontiy Magnitsky, who became famous as a teacher at this school and who entered Russian history as the author of the first Russian book on arithmetic, worked side by side with British instructors, serving primarily as a translator, and receiving hardly more than a third of their salary. Although his well-known ‘Arithmetic’ did contain original examples and exercises, it was largely a direct translation from western sources.7

The list of western mathematicians who influenced Russian education includes Leibniz, who advised Peter, and Leonhard Euler, who worked in Russia for decades, establishing not just a mathematical school there, but a methodological school as well. The introduction of western learning, carried out by order of the czar, did not always go smoothly. Evidence of resistance against enforced education has survived – evidence of efforts to halt instruction and evidence of massive desertions by students.8

These protests, however, were aimed at the very organization of mandatory schools. The use of western materials in the teaching of mathematics in itself had no stigma attached to it in those years, nor for many years afterwards. It was not in any way considered politically questionable, and it was not subject to administrative restrictions, even when such restrictions were introduced with regard to other materials arriving from Europe.

It is telling that when, in 1811, shortly before Napoleon invaded Russia, the Minister of Education, Razumovsky, sent the czar a report that warned about ‘the deep roots that education by foreigners has thrust into our fatherland’, it did not even occur to him to mention mathematics and mathematics textbooks.9 Fearing the influence of western revolutionary ideas in the 1830s, and even more so in the 1840s, the

7 See Vucinich, Science in Russian Culture; Poliakova, The History of Russian Mathematics Education. Here and in what follows, our discussion addresses western influences without examining distinctions between the various countries of Western Europe, and later the United States as well. In this respect, we follow the Russian tradition, which typically perceived the process of ‘westernization’ as a unified whole. However, differences between influences from different countries, as well as changes in the relative dominance of these influences, represent an interesting topic for investigation.
8 See Poliakova. The History of Russian Mathematics Education: 93–94.
authorities shut down and restricted foreign and private schools\textsuperscript{10} and intensified the censorship of western books and magazines; mathematical literature, however, remained beyond suspicion. Still later, in the 1860s and ’70s, when various restrictions were applied to the natural sciences and even more to the humanities,\textsuperscript{11} mathematics was considered politically safe, and the use of western learning that was free of ideological nuances was seen as something natural and beneficial which did not call for any special justification.\textsuperscript{12}

It should be noted that Russian mathematics was markedly more developed than many other sciences. In 1840, of the 28 members of the St. Petersburg Academy of Sciences – which was dedicated to the natural sciences and mathematics – only one was ethnically a Russian and three were Ukrainians. In order to avoid having foreigners constitute the overwhelming majority, Nicholas I united the St. Petersburg Academy of Sciences with the Imperial Russian Academy – which was dedicated to the humanities.\textsuperscript{13} But as far as mathematics was concerned, there was no special need for this: the Russian and the Ukrainians in the Academy were in fact the mathematicians, while even the ethnically non-Russian mathematicians in the Academy (such as Fuss) were Russian-born. Bunjakovskii, Ostrogradskii, Chebyshev or Lobachevsky – who was never accepted into the Academy – studied abroad or with foreign professors and their work constituted an integral part of world mathematics (such as it was at that time); but they themselves were Russians and founded Russian mathematical schools.

The study of mathematics on a much more elementary level was likewise commonly seen as a worthwhile pursuit, quite accessible to the average Russian. There are three fictional teachers who figure in Fonvizin’s famous play ‘The Minor’, written in 1781: the foreigner Vral’man (from \textit{vrat’} – ‘to lie’), an instructor in the French language ‘and all the sciences’; the seminary school dropout Kuteykin (from \textit{kut’ia} – a fruit porridge served at wakes), an instructor in Russian grammar; and, lastly, the retired sergeant Tsyfirkin (from \textit{tsifra} – ‘number’). The foreigner is, naturally, a rogue, who in addition turns out to be an ignoramus and a former coachman; Kuteykin, although a Russian, is also not an especially likeable character. But Tsyfirkin is an honest man, whose virtue is rewarded at the end of the play. Such a distribution of personal characteristics is not accidental, and although it is largely explained by the playwright’s clear preference for the soldier over the seminary student, his respect for Tsyfirkin’s area of expertise is also significant.

\textsuperscript{10} Ibid., 98.  
\textsuperscript{12} See for example Mazing, K. “Notes on Teaching Mathematics in Our Gymnasiums” [Zametki o prepodavanii matematiki v nashih gimnasiah]. \textit{Zhurnal Ministerstva narodnogo prosvesheniya} 2 (1872): 162–73.  
\textsuperscript{13} Vucinich, \textit{Science in Russian Culture}. 
During the nineteenth century, particularly during its second half, most textbooks were evidently written by Russian teachers and methodologists, but the critical use of foreign sources, as well as their translation and publication, was extremely widespread. Foreign textbooks were not infrequently used by teachers directly, in the original language. In his biography of Pafnutiy Chebyshev, V. E. Prudnikov emphasizes that Chebyshev – whose duties as a member of the Academic Committee of the Ministry included making catalogues of books that were fit for use in schools – always gave preference to Russian textbooks. As proof, Prudnikov cites a note that Chebyshev wrote about a collection of textbooks that another member of the Academic Committee had brought from abroad (their titles have not survived). Chebyshev found that ‘none of these textbooks merits a Russian translation or adaptation’.15

It would appear, however, that the researcher who unearthed this important archival document interpreted it – either voluntarily or by constraint – in keeping with the dominant ideology of his own time. What the document in fact illustrates is that it was considered necessary to look at foreign sources, while the fact that Chebyshev did not approve of the textbooks purchased by his colleague – who was not a mathematician – did not in the least prevent him from including foreign textbooks by Legendre, Mayer-d’Almbert and Choquet, and Wöckel in his catalogue of books, i.e. recommending these books for direct use.

And yet, even at that time, beneficial and home-grown mathematics education was contrasted with harmful influences from abroad. Leo Tolstoy’s 1874 article ‘On the People’s Education’ offers a vivid example of a journalistic expression of this view.

This article was written in the course of an ongoing debate between Tolstoy and a group of pedagogues (the methodologist-philologist Bunakov, the methodologist-mathematician Evtushevsky, and others) who introduced new methods into Russian education under the influence of contemporary German teaching methodologies.18 In mathematics education, they were influenced first and foremost by

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The arguments in the debate concerned such issues as whether teachers should spend a long time acquainting their students with small numbers and how they may be obtained (as Grube’s and Evtushevsky’s textbooks did), or whether they should immediately move on to numeration and working with large numbers (as Tolstoy proposed). Without going into a discussion of the advantages and disadvantages of the methods advocated by Tolstoy and his opponents here, let us just note that the public’s attention was clearly drawn to this discussion not so much by the methodological differences of opinion expressed in it, as by the socio-political positions that came to the fore in the course of the controversy. One such position consisted of making a contrast between ‘the people’s approach’ and ‘the German approach’.

Maybe the children of Hottentots, Blacks, maybe some German children, do not know what they are told in such lessons [Tolstoy wrote] When Russian children come to school, all of them – except the retarded ones – know not only what is down, what is up, what is a bench, what is a desk, what is 2, what is 1, and so on; in my experience, all peasant children sent to school by their parents know how to express their thoughts well and correctly, how to understand the thoughts of others (if they are expressed in Russian), and how to count to 20 and beyond. When they play the game of ‘babki’, they count in pairs, in sixes, and they know how many ‘babki’ and how many pairs there are in a six.

Tolstoy went on to explain that the new guidelines ‘devote all attention to teaching children something that they need not and cannot learn in school, something that all children learn from life’. The root of the problem, according to Tolstoy, turned out to be that:

... we have borrowed the educational techniques of our nearest neighbors, the Germans, first of all because we are always especially inclined to imitate the Germans; second of all, because these techniques are the most complicated and clever, and as long as we were taking from foreigners anyway, we would naturally want to take the latest techniques – the most fashionable and clever ones; and third of all, because these techniques were the most directly opposed to our own old techniques.

Tolstoy’s opponent Evtushevsky ironically summed up these and similar arguments in the following fashion: ‘Who is to blame in all this? The Germans. In our eyes, the poor Germans are responsible for everything’. In reply to Tolstoy, Evtushevsky raised the objection that a sensible teacher will determine during the first lesson what the children already know and will teach them what they do not know; nor did he miss the opportunity to rebuke Tolstoy with the failure of his teaching methods in practice.

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19 August Wilhelm Grube (1816–1884), German pedagogue and teacher educator; author of numerous textbooks for teacher education, for elementary schools. Highly influential was his “Leitfaden für das Rechnen in der Elementarschule, nach den Grundsitzen einer heuristischen Methode,” 1842, 1852.


21 Ibid., 93.

22 Ibid., 95.

The Moscow Committee on Literacy, which conducted studies of student performance, determined that students trained in the use of the Tolstoy method had difficulty solving the following problem: ‘10 blackbirds were sitting in a tree; 3 flew away; how many were left?’

‘Apparently’, Evtushevsky notes wryly, ‘these students never played “babki”’. Tolstoy considered arithmetic along with grammar to be the two subjects that contained no ideological content and therefore the only ones necessary for the people: ‘The people accept two areas of knowledge – the ones that are most precise and not subject to differences of opinion – languages and mathematics. Everything else, the people consider nonsense’. His own pedagogical views were naturally not free of ideology – he fought for the preservation of traditional peasant culture, in which, long term, ‘German’ schooling was a foreign presence. Tolstoy, who did a great deal for the people’s education, saw in the role of teacher a country deacon or a retired soldier (the same old Tsyfirkin!) going from house to house; in his opinion, this reflected the people’s desires and aspirations. Tolstoy expressed his opinions about social problems in a fashion familiar in journalism by contrasting the home-grown with the foreign-made. And indeed, for all its distance from any ideology, the study of arithmetic introduced concrete changes into traditional peasant society, and for this reason it too became the object of Tolstoy’s attacks (despite the fact that he was obviously closer to problems of language, and the most perceptive and brilliant parts of his article concern the awkward and ungrammatical style sometimes employed by the authors of school textbooks).

Tolstoy’s article shows that the antagonistic attitude toward the foreign – seen as harmful – that was present in Russian journalism could be carried over into the methodology of mathematics education. Nonetheless, his piece was an exception rather than the rule. The common view accepted Russia’s participation in the developments of European mathematics methodology, with an acknowledgement of the leading role played at that time by the ‘more civilized countries’, as people usually said at the time. Russian mathematics educators studied what was being done in the West, and frequently traveled to the West with the aim of becoming acquainted with western life and methods. It is typical that A. P. Kiselev, who would become the author of probably the most famous Russian textbook, deemed it necessary to take a trip abroad while he was still an impoverished student. The textbooks that he started writing and publishing over 10 years later, and which gradually captured a considerable part of the schoolbook market, open by indicating which foreign textbooks they drew on. This was in no way an exception from the common rule.

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24 Ibid., 52.
25 Ibid., 56.
27 Ibid., 117.
The moment when Russian mathematics methodology was explicitly acknowledged to be a part of world mathematics methodology came with the two Russian congresses of mathematics teachers, which took place in 1911–1912 and 1913–1914. ‘The reports presented at the Congress’, wrote the well-known methodologist Morduhaiboltovskoy (1912), ‘for the most part concern those ideas of reform that have at the present moment achieved popularity in Germany and France’.\(^\text{29}\) The ‘Reports of the First Congress’\(^\text{30}\) open with a description of the creation of the International Commission on Mathematics Education, one of the consequences of which was the convocation of the First Congress itself.\(^\text{31}\) One of the most active organizers and participants of both congresses was Prof. Dmitri Sintsov of Kharkov, a member of the Commission. At the Second Congress, his report concerning the work of the Commission was placed first, which Sintsov himself explained through the cardinal importance ‘of the review and radical updating of traditional materials that is taking place in civilized nations’.\(^\text{32}\) The reports at the Congress that were devoted to mathematics education and its reform usually focused specifically on the Russian situation, but always in connection with the international movement, of which the Russian methodologists saw themselves as an integral part.

It is probably fair to say that such innovations as the introduction of the idea of functional dependency into the school curriculum, and the study of analysis in secondary school, received the widest currency in Russia. However, practically all other proposals for reform had passionate Russian supporters as well, from innovations in teacher preparation to a restructuring of the course in geometry, oriented around the creation of a preparatory ‘intuitive’ course, or aiming to enhance visual clarity through the use of models and laboratory assignments. To be sure, the Russian mathematics educator was at liberty to disagree with one or another proposal; but it mattered little to him whether the proposal originated in St Petersburg or Kharkov, on the one hand, or Göttingen or Paris, on the other.

**The Post-Revolutionary Period**

The October Revolution, which took place under the slogans of internationalism and the struggle against great-power imperialism, to a certain extent only intensified the use of foreign sources. But these foreign sources were no longer the same, and were often much less familiar to Russians. In a letter to David Eugene Smith from 1928 which this author has found in the Columbia University Rare Book and Manuscript


Library, Dmitri Sintsov asks Smith to reply to several questions about American education ‘which is today very fashionable, so that anything that bears an American stamp is highly prized’ (translated from the French). And indeed, the most ‘modern’ and ‘liberal’ Dalton plan (‘which is here considered the latest word in American pedagogy’, as Sintsov writes) was being implemented everywhere in Russia at the time, with the backing of all the force of the centralized government. Mathematics was, in effect, swallowed up by general education and eliminated as a separate subject. As a result, the system of education that had taken shape in Russia with the participation of the West over the course of many centuries was largely destroyed. A sincere desire to combat rote memorization and drills, typical of gymnasiums before the Revolution, in practice often turned into a fight against any hint of in-depth learning, and against systematic and substantive education in general. A characteristic event, for example, was the sharp rejection of old textbooks (such as Kiselev’s) as uselessly systematic.33

In his letter Sintsov merely poses questions but his irritation with the developments taking place around him is evident. As someone connected to the international movement, Sintsov does not rush (at least in the letter to Smith) to condemn the foreign; he merely asks how widespread and accepted the new methods are abroad. To which Smith (a copy of whose response has also survived) replies in no uncertain terms about the unpopularity of the Dalton plan in America.

The government officially sanctioned the use of foreign sources and enforced such practices but it did so in a selective fashion, at the same time eliminating independent access to information on other contemporary developments (it is telling that in the correspondence between Sintsov and Smith which this author has studied, an important role is played by Sintsov’s requests to send him various books – other methodologists had no such opportunity to become acquainted with foreign literature).

At the beginning of the 1930s, the government decisively rejected the Revolutionary approach. The old, pre-Revolutionary textbooks (Kiselev’s) once again entered into circulation, and this time as universal, unique and mandatory texts. And if it was initially supposed that this was only a temporary measure,34 it turned out that it would last for decades – the last class that used Kiselev’s texts graduated in 1976.

The developments that took place at this time have been seen by some researchers of Russian education35 as a kind of triumph of older cultural traditions. In reality, however, the most important aspects of these traditions were not re-established. This applies to mathematics education as well (even if the damage here was not as great as in other areas). The 80-year-old Kiselev was awarded the Order of the Red Banner of

Labor and ended his days respected and honored, but the years spent abroad by members of the family were never mentioned in his house, nor just in case was his fluent command of French.36

In 1936, the mathematician Nikolai Luzin became the victim of a political campaign waged against him.37 Luzin was accused, among other things, of ‘deliberately sending his best work abroad with a perfectly concrete political intent, and only publishing “all kinds of nonsense” – to use his own cynical words – in the USSR’.38 In the course of this campaign, a more general issue was raised: the widespread practice among scientists and mathematicians of publishing their work abroad was no longer considered acceptable. ‘Such a situation can no longer be tolerated. The Soviet Union is not Mexico, or some kind of Uruguay, but a great socialist power’, wrote the author of the article ‘Traditions of Servility’, which was printed in Pravda, the newspaper of the Central Committee of the Communist Party.39

Luzin’s case focused on academic science, although it started with a charge that Luzin was unpatriotic – due to his excessive praise of a Moscow school that he had visited. In the opinion of his detractors, this showed that Luzin had come to the school initially prejudiced against it, and in addition wished to do the school harm by condoning its shortcomings.40

Naturally, it is impossible not to agree with D. Aleksandrov,41 who showed that Russian scientists stopped publishing papers in the West for a complex set of reasons that cannot be reduced to the simple carrying out of an order not to publish abroad. Nevertheless, scientists were in fact given such a direct order: there is no other way to understand the Pravda article, which was approved by Stalin personally.42 As far as school mathematics was concerned, such orders were not even needed. The closed and centralized organization of the school system automatically ruled out the use of foreign sources, without requiring any additional administrative measures aimed specifically at mathematics education.

Indeed, to a certain extent the opposite was true: it was considered desirable and appropriate to study foreign developments in mathematics education. For example, at a conference of mathematics teachers that took place in 1935, a report was presented on the ‘instructional-methodological literature of foreign countries – France,
Denmark, America, Japan, and others’. This report was specifically explained and justified in corresponding articles. Textbooks written by foreign mathematicians were then and later used in colleges in teacher preparation courses. However, the influence of what was taking place abroad was substantially smaller than it had been before. For example, virtually no high school textbooks from abroad made it into the Soviet Union, and the ones that did were inaccessible to almost all teachers, since the level of knowledge of foreign languages among these individuals was by this time considerably lower than it had been prior to the Revolution.

In addition, by the late 1940s and early 1950s, journalism of a so-called ‘patriotic’ variety became absolutely universal. It did less damage to mathematics education than to many other fields. For example, while references to American editions survived in Kiselev’s textbooks, it would have been impossible to imagine such references in textbooks on any other subject. Even so, deliberate emphasis was commonly placed on the contribution made by Russian mathematicians and methodologists; they were contrasted with foreign methodologists; efforts were made to reveal the malicious intent of foreign or ethnically non-Russian methodologists, who supposedly sought to undermine Russian education in one way or another; and so on. For example, in A. V. Lankov’s book ‘Toward a History of the Development of Progressive Ideas in Russian Mathematics Methodology’, a whole chapter is called ‘From the History of the Struggle Against Foreign Influences in Russian Mathematics’, and respect is accorded to the views of a certain Leksin (an absolute unknown and, in the opinion of the author of the book himself, a verbose writer and one not particularly familiar with the professional literature on methodology) that ‘the natural virtues of the Russian people will rip through and shed the cobwebs [of Western European ideas] that cover them’. In such an atmosphere, it would have been inappropriate and dangerous to propose using one or another discovery of foreign methodology.

Likewise, in later, more liberal times, the rare translations of foreign schoolbooks that were published in Russia, as well as articles on foreign methods that regularly appeared in professional periodicals, were in large part merely ethnographic curiosities and exerted no serious influence on mathematics education. The existing courses were so rigidly defined that there was practically no room for experimentation. Foreign findings were undoubtedly taken into account to some degree (at times a considerable one) when decisions were made that concerned Soviet mathematics as a whole; but this was done behind closed doors and by a very small group of people.

The isolation of Russian mathematics education by no means resulted in an immediate drop in its quality. To a certain extent, the opposite was the case. Thanks, at least in part, to this isolation and to its unchanging character, Russian mathematics education for a long time succeeded in preserving and even developing features that had been formed in an earlier period. This was indeed a splendid isolation.

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educational passion of the pre-Revolutionary Russian intelligentsia, which inspired people to go out and educate the illiterate country, endured in the traditions of working with students and in the scientific mathematical community’s conviction that such work was an important part of its activity. Naturally, the involvement of Russian professional mathematicians in the education of schoolchildren, which was so surprising to foreigners, owed something to specific pressures exerted on them by the authorities, as well as to the fact that many fields that were open to their colleagues in the West were simply inaccessible to Russian scientists. But this did not make the system of values that evolved in the Russian mathematics community any less important.

A. P. Kiselev, the author of textbooks that became symbols of the immutability and immobility of Russian mathematics education, himself had to struggle to obtain a serious education, and for this reason spent his life trying to make it easier for children to obtain a true education in mathematics – a mathematics education that was deep and theoretical. In the USSR his course was offered to all children. Such educational optimism, which was initially formed not without a considerable influence from western ideas, endured in Russian mathematics education even when in other countries it had given way to ‘this brutal pessimism’, which lightly condones the fact that millions of children never become acquainted with real mathematics at all, and assumes that they have no need for it anyway.

On the other hand, the Iron Curtain also separated Russian mathematics education from new ideas and discoveries and, most importantly, it could not save Russian mathematics education from domestic social developments, which also gradually undermined the old traditions that had been inherited from the Russian democratic movement. Instead of a universal in-depth and theoretical education, a system gradually took shape that offered merely the appearance of such an education – formally preserving its old contents, while losing its true spirit and disguising its ineffectiveness.

It was not by accident that the attempt to overcome the stagnation in mathematics education was made during the brief period of the thaw in the Soviet Union, after the debunking of Stalin’s cult of personality and before the Soviet army’s invasion of Czechoslovakia, which marked the limit of possible reforms. Nor was it by accident that this attempt turned out to be connected to similar movements in the West – the so-called New Math.

The reform, which was carried out by the academician Andrei Kolmogorov, called for the introduction of new textbooks in the schools and for changes in the substance and style of mathematics education. The textbooks were organized on the basis of set theory; in geometry, transformations replaced classic triangle congruence relations as

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46 Karp, A. P. Algebra Graduation Exams in Russia over the last 100 years [Pis’mennye vypusknye eksameny po algebra v Rossii sa 100 let]. St. Petersburg: SPbGUPM, 1998.
the foundation of all proofs; combinatorics appeared; and the role of mathematical analysis increased dramatically.

Our task here is not to analyze the advantages and shortcomings of the new textbooks. Let us merely note their obvious connection to what was going on in the West, underscored by the publication of works in translation and frequent references to them. It had been a long time since such tendencies could be observed in Russian mathematics education. The new approach, however, was implemented using the old, centralized methods, instantly and universally (which in our view largely explains the mostly negative reaction of the mathematics education community). A more natural and smoother transition, a calmer acquaintance with the new ideas, might have made it possible to develop better textbooks and to overcome existing difficulties. But there was no time allotted for such things. The rejection of New Math in the West coincided with a general growing inflexibility in the USSR at the end of the 1970s.

Not by accident, the milestone in the elimination of Kolmogorov’s reforms was marked by an article published by another outstanding mathematician, Lev Pontrjagin, in the most important ideological periodical in the country, Kommunist.47 Publication in this magazine automatically gave a political thrust to Pontriagin’s statements concerning the destruction of mathematics education in the country and its detachment from practical needs. Writing that the reforms had been implemented in the spirit of modernization and the desire to keep up with the West, Pontriagin himself made references to French mathematicians who criticized New Math. In this way, Russia was not directly contrasted with the rest of the world. However, by arguing along these lines – and by criticizing textbooks for such points of style as using ‘the term “congruence”, which sounds unnatural to the Russian ear, instead of “equality”’ – Pontriagin instilled in his readers the fear that things in Russia would become as bad as they were abroad in the readers’ opinion.

Kolmogorov’s reforms were rolled back, and although the old textbooks did not reappear in the schools, new books were introduced that signaled a return to old methods. It was with these textbooks that the country entered Gorbachev’s perestroika, which ushered in the current period in the development of Russia and Russian mathematics education, a period detailed research of which lies outside the scope of this article.

Conclusion

In sum, it is fair to say that Russian mathematics education has lost the unique sense of kinship with foreign education that once characterized it. The most effective means of achieving isolation in mathematics education has turned out to be neither special administrative measures nor propagandistic and journalistic polemics, but simply the absence of information from abroad. Isolationism in mathematics education develops

against a background of general isolationism in science and in social life, which stands in the way of a natural exchange of information, and which predisposes the public to an oppositional stance against the rest of the world, supplying ready-made journalistic clichés when they are needed. The isolation of mathematics education turns out to be an important part of the general isolation, since it serves as an example (no matter how dubious) of the fact that an isolationist stance can be fruitful.

The isolation of mathematics education, as the Russian experience of the last few years illustrates, is by no means automatically overcome when restrictions on bringing books from abroad are abolished and when a greater number of teachers begin to travel outside the country. Before the Revolution, the Russian intelligentsia – and mathematics educators in particular – enjoyed a unique sense of connection to other countries (France and Germany, in the first place). Once that sense has been destroyed, it cannot be expected to reappear on its own. What is needed is an understanding and a recognition of the fact that the problems that confront mathematics educators are common problems. On top of this, introducing foreign discoveries in a centralized fashion – ‘by order of the czar’ – usually provokes resistance, which is often justified by fears about the fate of those elements in domestic education that do work successfully.

Insistence on the importance of becoming acquainted with foreign discoveries is heard everywhere today, although in practice Russian mathematics education remains largely isolated – practically unknown abroad, but also usually not seeing itself as a part of broader developments taking place in the world. Whether this isolation will be overcome, and if so, when and how – only time will tell.