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## THE TRAGEDY OF MATHEMATICS IN RUSSIA

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ABSTRACT. This is a brief overview of the role of mathematicians in the so-called “Luzin Case” as well as some analysis of the mathematical and humanitarian roots of the affair.



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## LUZIN AND HIS STUDENTS

Nikolaï Nikolaevich Luzin (1883–1950) was one of the founding fathers of the Moscow mathematical school.

The list of his students contains Full Members of the Academy P. S. Aleksandroff (1896–1982), A. N. Kolmogorov (1903–1987), M. A. Lavrentiev (1900–1980), P. S. Novikov (1901–1975); Corresponding Members L. A. Lyusternik (1899–1981), A. A. Lyapunov (1911–1973), D. E. Menshov (1892–1988), A. Ya. Khinchin (1894–1959), L. G. Shnirelman (1905–1938); and many other mathematicians.

The outstanding roles in the development of mathematics in Siberia were performed by M. M. Lavrentiev and A. A. Lyapunov, Luzin’s direct descendants as well as Academicians A. I. Maltsev (1909–1967) and A. A. Borovkov, students of A. N. Kolmogorov.

## THE CASE AGAINST LUZIN

Tsunami swept over the Russian mathematical community in 1999 after publication of the complete shorthand notes of the meetings of the notorious emergency Commission of the Academy of Sciences of the USSR on the case of Academician Luzin [1]. Soon the article [2] appeared in the USA which revealed the personal testimony of G. G. Lorentz (1910–2006) about the mathematical life of that time in the USSR.<sup>1</sup>

The Commission for the “hearing of the case of Ac[ademician] Luzin” was convened by the Presidium of the Academy of Sciences of the USSR after the article “Enemies under the Mask of a Soviet Citizen” in the *Pravda* newspaper on July 3, 1936.

Luzin was accused of all theoretically possible instances of misconduct in science and depicted as an enemy that combined “moral unscrupulousness and scientific dishonesty with deeply concealed enmity and hatred to every bit of the Soviet life.” It was alleged that he publishes “would-be scientific papers,” “feels no shame in declaring the discoveries of his students to be his own achievements,” and stands close to the ideology of the “black hundred”, orthodoxy, and monarchy “fascist-type modernized but slightly.” The closing of the lampoon read:

The Soviet scientific community tears away from you the mask of an honest scientist, leaving you in the altogether, and so you appear before the eyes of the world as a paltry individual who pretends to champion “pure science” but betrays the interests of science, merchandizing it to appease you former bosses—the present-day masters, of fascistoid science. The Soviet community will perceive the story about Academician Luzin as another object-lesson of the fact that the adversary never lays down his arms, that he camouflages himself more skilfully, that the methods of his mimicry becomes more diverse, and that vigilance remains the most demanded trait of every Bolshevik and every Soviet citizen.

All Russian scientists of the elder generation knew about the *Pravda* editorial and the savage dissolution of “Luzinism.” There was no denying that the initiation of the campaign for discrediting Luzin was carried out by the symbiosis of the party and repressive machinery of the USSR. Behind the scenes of the campaign

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<sup>1</sup>I am very grateful to Professor W. A. J. Luxemburg for attracting my attention to the inadvertent omission of a reference to [2] in the draft of this paper.

loomed the grim figures of E. N. Kolman (1892–1979) and L. Z. Mekhlis (1889–1953), typical representatives of the *Oprichnina* of the Stalinist epoch. The former was Head of the Department of Science of the Moscow Committee of the All-Union Communist Party (Bolsheviks), while the latter was Editor-in-Chief of *Pravda*.

The Luzin case had been considered only within the context of the general crimes of the Stalin totalitarianism for a long while. The newly-published archive files have opened to the public the new circumstances—some students of Luzin were rather active participants of the political assault on their teacher. The key role among them was played by P. S. Aleksandroff who headed the Moscow topological school.

S. P. Novikov<sup>2</sup> wrote in his reminiscences (cp. [3, p. 48]):

Investigation was launched that time by my father (seemingly, with Lyusternik and Lavrentiev, the latter knowledgeable about the Party circles). They found out there was a letter from P. Aleksandroff to some influential guy, Khvorostin by name.<sup>3</sup> This letter narrated the nasty deeds of Luzin. Khvorostin resided in Saratov and had great connections within the C[entral] C[ommittee of the Party]. He hated Luzin, which was known to everyone. It was Khvorostin as they guessed out who submitted materials to the CC and initiated the article. Pavel Sergeevich was a great master of a billiard shot!

Luzin was especially annoyed by the invectives of P. S. Aleksandroff which were aimed at the declension of Luzin’s contribution to analytic set theory (cp. [4]). It is now in common parlance to call an analytic set the continuous image of a Borel subset of the reals. These sets are often associated with the names Aleksandroff and Suslin and called *A*-sets or Suslin sets. Note that P. S. Aleksandroff commented at the meeting of the Commission on July 6, 1936 as follows (cp. [1, p. 90]):

Suslin called them *A*-sets. But he never told that he called them so in my honor.

In his reminiscences of 1979 he claimed quite the opposite (cp. [6, p. 235]):

It was exactly then that Suslin proposed to call the new set theoretic operation that I had constructed the *A*-operation while calling *A*-sets those that result from application of the operation to closed sets. Doing so, he emphasized that he was suggesting this terminology in my honor by analogy with Borel sets which were customarily called *B*-sets those days.

There was a mysterious relevant episode about the history of the discovery of *A*-sets which was narrated by A. P. Yushkevich (1906–1993) not long before his death (cp. [5]):

During our rather often meetings in the second half of the 1970s, I repeatedly asked P. S. about the history of the discovery of *A*-sets. One day he rang me up and suggested that I would come to his apartments at an appointed time when he would stay alone. I had to enter into the waiting room without ringing the door bell, and P. S. would be seated on a chair quite opposite to the door. All happened exactly as planned. His narration was lengthy. I wrote it down. On the next day I brought the typewritten text of my record, and P. S. told that it conforms completely with what he had said, but stipulated the condition that the record be never published during his life time. When P. S. had passed away in 1982, I decided to take the advice of

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<sup>2</sup>Sergei Petrovich Novikov is a Fields medalist, the son of L. V. Keldysh and P. S. Novikov who were students of Luzin.

<sup>3</sup>G. K. Khvorostin (1900–1938) was an educated mathematician, Rector of Saratov State University in 1935–1937. A. Ya. Khinchin qualified him as “the Party youth” (cp. [1, p. 100]).

A. N. [Kolmogorov (S. K.)]. After listening the text, A. N. told me that to publish it was still too early. Now there are neither P. S. nor A. N., and I have nobody else to take advice of. I decided to seal the narration of P. S. Aleksandroff in an envelope and put it to the Archive of the Academy of Sciences of the USSR for deposition in the Aleksandroff Fond with the inscription: “Received from A. P. Yushkevich. Open only after 10 years since his death.”<sup>4</sup>

Rather active at the meetings of the Commission were A. N. Kolmogorov, L. A. Lyusternik, A. Ya. Khinchin, and L. G. Shnirelman. The political attacks on Luzin were vigorously supported by members of the Commission S. L. Sobolev (1907–1989) and O. Yu. Schmidt (1891–1956). A. N. Krylov (1863–1945) and S. N. Bernstein (1880–1968) revealed valor in the vigorous defence of Luzin. The final clause of the official Resolution of the Commission read as follows (cp. [1, p. 296]):

Everything of the above, summarizing the overwhelming material evidence in possession of the Academy of Sciences, completely ascertains the characteristics of Luzin in the *Pravda* newspaper.

All participants of the events of 1936 we discuss had left this world. They seemingly failed to know that the files of the Commission are all safe and intact. Today we are aware in precise detail of what happened at the meetings of the Commission and around the whole case. The mathematical community painfully reconsiders the events and rethinks the role of the students of Luzin in his political execution.

#### ROLES OF LUZIN’S STUDENTS

P. S. Novikov and M. A. Lavrentiev were not listed as participants of the public persecution of Luzin (despite the fact that both were mentioned at the meetings of the Commission among the persons robbed by Luzin). It transpires now why M. A. Lavrentiev was the sole author of a memorial article [7] in *Russian Mathematical Surveys* on the occasion of the ninetieth anniversary of the birth of Luzin. He also included this article in the collection [8] of his papers on the general issues of science and life. M. A. Lavrentiev was the chairman of the editorial board of the selected works of Luzin which were published by the decision of the Academy of Sciences of the USSR after the death of Luzin on the occasion of the 70th anniversary of his birth. P. S. Aleksandroff and A. N. Kolmogorov were absent from the editorial board.

Practically the same are the comments on their relationship with Luzin which were left by P. S. Aleksandroff and A. N. Kolmogorov. Their statements are still shared to some extent by their numerous students. It is customary to emphasize that Luzin was not so great a mathematician as his students that had persecuted him. Some moral fault is persistently incriminated to Luzin in the untimely death of M. Ya. Suslin (1894–1919) from typhus fever. Luzin is often blamed for all his disasters at least partly. He is ascribed such traits of character as theatricality, envy of others’ success, hypocrisy, plagiarism, and inclination to intriguing.<sup>5</sup> He is said to

<sup>4</sup>J.-M. Kantor informed me that his attempts, and the attempts by S. S. Demidov either, were in vain to find this envelope in the Archive of the Russian Academy of Sciences (S. K.).

<sup>5</sup>No person with these defects of personality could ever become the founder of “Lusitania”—the most successful mathematical school in the history of world science. Therefore, there exists a rather likely theory of the “two Luzins”: one of the epoch of Lusitania and the other of the times of the Luzin case.

deserve all punishments and if not all then it is not his students' fault but Stalinism and the curse of the epoch. These arguments reside in the minds of not only the elders but also the youngsters. The best of them view the Luzin case as the mutual tragedy of all participants.

We should however distinguish the personal tragedy of Luzin from the tragedy of the Moscow school and the tragedy of the national mathematical community. The students of Luzin who participated in the persecution of the teacher never considered their own fates tragical.

P. S. Aleksandroff wrote in his reminiscences (cp. [6, p. 90]):<sup>6</sup>

Knowing Luzin in his green creative years, I got acquaintance with a truly inspired teacher and scholar who lived only by science and in the name of science. I met a person who resided in the sphere of the sublime human treasures which is forbidden for any rotten ghost or spirit. When a human being leaves this sphere (and Luzin had left it once), he is doomed to surrender to the forces that were described by Goethe as follows:

Ihr führt in's Leben uns hinein,  
Ihr lasst den Armen Schuldig werden  
Dann überlasst Ihr ihn der Pein,  
Denn jede Schuld rächt sich auf Erden.  
Into our life you lead us in,  
The wretch's guilt you bring to birth,  
Then bring affliction down on sin,  
For all guilt takes revenge on Earth.

In his terminal years Luzin saw the bottom of the sour bowl of the revenge that was described by Goethe.

It is worth observing that A. Ya. Khinchin, hostile to Luzin, commented on the accusations that Luzin drove M. Ya. Suslin to death (cp. [5, p. 391]):

Suslin is called the student perished by N. N. Luzin. Why, when a man dies from typhus fever this is a rather exaggerated expression. In fact Suslin could possibly get typhus fever in Ivanovo. Furthermore, in the common opinion it was N. N. who tried and expelled Suslin from Ivanovo. But the transfer from Moscow to Ivanovo I view as a favor to Suslin who was not hostile to Luzin in those days.

Narrating his reminiscences of P. S. Aleksandroff, A. N. Kolmogorov told in 1982 (cp. [11, p. 10]):

My entire life as a whole was full of happiness.

Neither he nor Aleksandroff nor other participants of the persecution of Luzin had ever treated the Luzin case as a common tragedy with Luzin. They were correct in this judgement but on the grounds completely different from those they declared.

If Luzin were guilty then his fault would belong to the sphere of the personal mathematical relations between a teacher and a student. No convincing evidence of Luzin's plagiarism was ever submitted. The alleged accusations that he ascribed to H. Lebesgue (1875–1941) or kept a grip of Suslin's results are poorly disguised and baseless. To prove the scientific misconduct of Luzin it was alleged that Luzin ingratiated and flattered H. Lebesgue by ascribing Luzin's sieve method to

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<sup>6</sup>P. S. Aleksandroff cited the poem *Harfenspieler* dated as of 1795 by Johann Wolfgang von Goethe (1749–1832) and gave a rough translation into Russian. The lines in English here belong to Vernon Watkins (1906–1967).

H. Lebesgue. On the other hand, H. Lebesgue wrote in his preface to the Luzin book on analytic sets (cp. [12]):

Anyone will be astonished to find out from Luzin's book that I had incidentally invented the sieve method and was the first to construct an analytic set. But nobody could be more amazed than me. Mr. Luzin feels himself happy only when he has managed to ascribe his own discoveries to someone else.

The students were "more Catholic than the Pope."<sup>7</sup>

In any case, we cannot help but ascertain that there clearly was a conflict of generations—the precipice of alienation and misunderstanding between Luzin and his most successful students. It is easy to assume the genuine or imaginary injustice and prejudice of Luzin in citing his students as well as the genuine or imaginary feebleness of Luzin in overcoming mathematical obstacles. We may agree to see hypocrisy in Luzin's decision to vote against P. S. Aleksandroff in the elections to a vacancy of an academician despite his personal letter of support of P. S. Aleksandroff to A. N. Kolmogorov. Well, there is nothing untypical of the academic manners or extraordinary in Luzin's conduct, is there? It is the true background of the Luzin case, isn't it?

Available is the following testimony of W. Sierpiński (1882–1969), a famous Polish mathematician who was declared to be a "blatant black hundredist" at the meetings of the Commission of the Academy of Sciences of the USSR on the Luzin case (cp. [13, p. 124]):

In his letter as of June 27, 1935—which was a year ago—Mr. Luzin wrote: "Returning now to my very difficult self-defence against the ascription to Suslin of the results which he had no rights to and which were absent even in his thoughts, I must say that this self-defence was provoked by a very grave and absolutely impending danger. Mr. Aleksandroff has dreams of entering the Academy of Sciences as a full member by dismissing me. To this end he requests that my contributions be reconsidered, claiming that I has no right to be a member of the Academy since all my ideas are stolen from Suslin. This reconsideration is rather likely and feasible." When I was in Moscow in September, 1935, Mr. Aleksandroff assured me that the apprehensions of Luzin are purely imaginary and that he respects Luzin, his former teacher. In my presence Aleksandroff shook hands with Luzin and declared that he would always be a friend of Luzin.

The pretentious reconciliation of P. S. Aleksandroff with Luzin which was described by W. Sierpiński and which was later publicly refuted by P. S. Aleksandroff is in no way similar to the refusal of Luzin to support the election of P. S. Aleksandroff as an academician, isn't it? It is in general belief that this refusal was the reason for A. N. Kolmogorov to slap the face of Luzin publicly

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<sup>7</sup>The corresponding excerpt of the shorthand minutes of the meeting of the Commission on July 13, 1936 is as follows: [1, p. 196–197]:

**Aleksandroff.** As regards obsequiousness, I suggest that we will use the genuine words of the lips of Lebesgue: (Reads in French). Concerning this matter, I have explanations that I can explicate as thoroughly as need be. The "strange mania" in question, I would say, is a deeply premeditated idea. He ascribed to Lebesgue his belongings and he did it in so dopey manner. No sane person would ever ascribe them to Lebesgue. The thing is that doing so he creates his reputation of the person who ascribes his own ideas to someone else; but when the matter concerns his own students then he robbed their belongings while hiding behind this screen.

**Lyusternik.** This kind of defence sounded at the meeting in the [Steklov (S. K.)] Institute. Precisely this way of defence that was clearly inspired by him: How might it happen that N. N. grips the results of the others if Lebesgue himself writes these words about him?

**Aleksandroff.** This is an obsequious system since it is uncustomary in academic circles to ascribe someone's own results to anybody else. Therefore, we see here, on the one hand, his flattery of Lebesgue and, on the other hand, the arranging of the screen that allows him to behave so.

in 1946.<sup>8</sup> L. S. Pontryagin (1908–1988) wrote on December 24, 1946 (cp. [16, Letter No. 49, pp. 89–91]):

You are asking about cooperation of Kolmogorov and Luzin. Surely, this needs to be narrated rather than written since the mode of voice is essential to render all properly. In summer Kolmogorov told me that his only concern about the election of Aleksandroff consists in the fact that he became an obvious candidate four months before the elections. *Pusiks*<sup>9</sup> carried out a great preparatory work in the sense that entered into various agreements with academicians. For instance, there was a promise to Vinogradov that Kolmogorov would support Lavrentiev in the event that Vinogradov would support Aleksandroff. All in all it seemed that everyone will vote for Aleksandroff. For example, Bernstein had nominated Aleksandroff at a meeting of the [Steklov] Institute as well as Chebotarëv, I must mention for the sake of truth. Kolmogorov had made an agreement with the bosses of the Academy that he will be a member of the Board of Experts.<sup>10</sup> The first annoying news was the fact that he had not been assigned to the Board, but he still hoped that this was not essential already. After the session of the Board of Experts there were a few closed meetings of all academicians where they discussed the candidates, and only at that stage Kolmogorov became aware that none of the members of the Board of Experts had supported Aleksandroff. On the contrary, Bernstein vigorously objected against him, claiming that Aleksandroff's area of research is harmful. Bernstein's behavior still seems highly illogical for me; probably he had just quarreled with *Pusiks*. All the rest is rather comprehensible. Lavrentiev turned out an unquestionable candidate somehow and he had no need in the support of Kolmogorov who was not a member of the Board at that. Therefore, Vinogradov had no need in Kolmogorov and *Pusik*. As regards Sobolev and Khristianovich, the former deeply hated *Pusik* for expelling Sobolev from the directorship [of the Steklov Institute (**S.K.**)], while the latter is a crony and companion of Sobolev. In these circumstances there was practically no hope of success. The only remaining possibility was that some academicians among mathematicians would support Aleksandroff, for physicists wanted to support him but surely that could not confront all mathematicians. Luzin became the hope of *Pusiks*. He was invited to Komarovka and promised his support. However, he spoke against Aleksandroff at the final closed meeting. Departing from this meeting, Kolmogorov was absolutely upset and stung. He came to Luzin and said that he would have nothing in common with Luzin ever since. Luzin pretended that he did not understand anything and began to talk as follows: "Dear me, calm down. Forget it. You are ill. Relax." This is what must be narrated with expression. Kolmogorov then answered him: "So what shall I do to you: spit at your physiognomy or slap your mug?" After a short thought, he dared the latter.<sup>11</sup>

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<sup>8</sup>About various versions of this episode see the recent book by L. Graham and J.-M. Kantor [14, p. 186] as well as the reminiscences of S. M. Nikolskiĭ [15, p. 155] and S. P. Novikov [3, p. 22].

<sup>9</sup>With the letter *u* pronounced as *oo* in *soon*, *Pusiks* was the collective equivocal nickname of P. S. Aleksandroff and A. N. Kolmogorov. The singular *Pusik* was applied only to P. S. Aleksandroff. For the English ear the word *Pusiks* has an obscene connotation, but this effect is completely absent in Russian.

<sup>10</sup>This is an interim committee convened at the elections that discusses all nominees and chooses those that are recommended to be elected. The names of the recommended nominees appear at the top on voting bulletins, which prompts the choice of those unacquainted with the candidates.

<sup>11</sup>The elections to the Academy of Sciences of the USSR in 1946 took place on November 30. It was M. A. Lavrentiev and I. G. Petrovskiĭ (1901–1973) who were elected to fill the mathematical vacancies of a full member in the Division of Physics and Mathematics. A. D. Alexandrov (1912–1999), N. N.

V. M. Tikhomirov disclosed the correspondence between Luzin and A. N. Kolmogorov on the eve of the elections of P. S. Aleksandroff. In the fall of 1945 Luzin wrote to A. N. Kolmogorov (cp. [11, p. 80]):

Now about another matter: the time is coming of the elections to the Academy. It would be an utmost injustice, had these be happened without Pavel Sergeevich. His works whose echoes are met throughout the world literature, his splendid ripe years—the completion of maturity and wisdom and he himself as the man of perfect attraction—all these made us see in him a wordy candidate who activity is invaluable for the Academy.

A. N. Kolmogorov overestimated the position of Luzin who had written nothing more than that he will support P. S. Aleksandroff as a nominee for the elections (which Luzin fulfilled in due time).

In the reply letter of October 7, 1945 A. N. Kolmogorov remarked (cp. [11, p. 82]).

Since for many years I am engrossed in preventing the various random and immaterial circumstances to hinder the election of Pavel Sergeevich which would be a rather just event in my opinion; therefore, I indeed appraise very highly your readiness to support all necessary actions for the success when this is really desired.

Clearly, A. N. Kolmogorov decided without proper grounds that Luzin would support the election rather than nomination of P. S. Aleksandroff. Luzin however promised nothing of the sort in his letter. It is the tradition of a long standing that nomination and election to the Academy of Sciences and other similar institutions are sufficiently independent procedures.

Usually A. N. Kolmogorov was viewed as a calm person not liable to fits and extremes of temper. Therefore, he seemingly needed some special provocation from Luzin for slapping in Luzin's face, which led to some apocrypha about an obscene remark from Luzin at the elections of 1946.<sup>12</sup> An analogous version was mentioned by V. I. Arnold (1937–2010) in private correspondence. It is not excluded that the available hints on *topolozhstvo*<sup>13</sup> is a produce of the 1950s put in gossips for rehabilitation of the instigators of the “Luzin case.” But the students of A. N. Kolmogorov indicated one quite unknown trait of his personality. V. M. Tikhomirov wrote (cp. [11, p. 83]):

... it should be noticed there was some rather unsavory particularity: sometimes he lost his temper.

V. I. Arnold witnessed (cp [17, p. 50]):

Andreï Nikolaevich was never too good-natured and he narrated not without pride about his clash with police at the Yaroslavl Railway Station.

Luzin was twenty years older than A. N. Kolmogorov. Luzin was a teacher of A. N. Kolmogorov and carried the heavy burden of political accusations that were imposed on Luzin with participation of P. S. Aleksandroff and A. N. Kolmogorov. Luzin was granted “mercy” and accepted at the country house of A. N. Kolmogorov

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Bogolyubov (1909–1992), L. A. Lyusternik, and V. V. Stepanov (1889–1950) became corresponding members of the Academy.

<sup>12</sup>E.g., see [14, p. 186] and [3, p. 22].

<sup>13</sup>This is a portmanteau of the Russian words for topology and pederasty—something like “topologasty” in English.

and P. S. Aleksandroff in Komarovka before the elections.<sup>14</sup> Everyone at the meeting remembered the most important matter that Luzin was victimized and must surrender to the noble victors, didn't he? It transpires now, doesn't it? We can compare the internal academic matters, say Luzin's misconduct and even plagiarism, with the accusations of subversive activities against the Soviet life, can't we? These grave and vexed questions...

Closing the meeting on July 13, 1936, Academician G. M. Krzhizhanovskii (1872–1959), Chairman of the Commission, told in particular (cp. [1, p. 196]):

We then must think over the following matter. This fall the elections are in order and we are hinted that there will be vacancies for 30 new academicians and 60 new corresponding members. We are to refresh the body of the Academy, and by the Assembly of the Academy in September you have to ponder over and decide on whom you will recommend to be elected as corresponding members and academicians. This will be the best outcome of the work of this Commission.

No elections to the Academy were arranged in 1936. The great elections took place only on January 29, 1939 (cp. [23, No. 241, No. 242]). The following mathematicians were elected to the Department of Mathematical and Natural Sciences of the Academy: A. N. Kolmogorov and S. L. Sobolev became full members, while A. O. Gelfond, L. S. Pontryagin, and A. Ya. Khinchin became corresponding members. A. N. Kolmogorov was also elected Academician–Secretary of the Department of Physical and Mathematical Sciences and a member of the Presidium of the Academy.

#### REACTIONS OF LUZIN'S CONTEMPORARIES

All moral accusations against Luzin are rather inconvincible. That which was submitted as proofs was inadequate even in the times of the Commission neither for P. L. Kapitsa (1894–1984), nor V. I. Vernadsky (1863–1945), nor A. Denjoy (1884–1974), nor Lebesgue, nor many other elder persons.

The objections of Kapitsa were expressed on July 6 in his letter to V. M. Molotov who was the Chairmen of the Council of the People's Commissars of the USSR. V. I. Vernadsky noticed in his diary on the next day (cp. [18, p. 92]):

Letters to Luzin, Chaplygin, and Fersman about him. Majority treats as demonstrated the slander and insinuations. M[ay] b[e], he [is needed] abroad but not at home. I am afraid that this disgusting article will affect him much. Many conversations and many impressions.

On the same day he sent a letter to Academician A. E. Fersman (1883–1945), a member of the Commission. V. I. Vernadsky remarked (cp. [18, p. 94]):

I think that such an episode would eventually be perilous to the Academy were it led to the expulsion of N. N. [Luzin] from the Academy or any similar actions. We would slide down the slippery slope.

And on July 11 S. A. Chaplygin (1869–1942) wrote to V. I. Vernadsky (cp. [19, p. 106–107]):

The article about Luzin is completely outrageous: Supposing that he committed a sin of misjudging some applicant for a scientific degree or title, but how is it possible

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<sup>14</sup>V. M. Tikhomirov wrote about the meeting in Komarovka: "The correspondence of L. S. Pontryagin and his student and friend I. I. Gordon reveals that Luzin was accepted and served a meal in Komarovka." Cp. [11, p. 83].

to jump to the conclusion of sabotage from that?! ... As far as the accusations, slipping through the article, of fascism and his enlisting the old reactionary Moscow school of mathematics, I am completely unable to understand these. There remains the critical evaluation of Luzin's contributions. But in this regard I must say only that this discloses the complete incompetence of the authors which proves their minor and superficial acquaintance with his works and their deliberate distortion of correct evaluation. His authority is incomparable with that of Khinchin who is counterpoised to him. But what should be done right away? How can we help N. N.? I did only one thing yet: I sent N. N. a cable whose copy I attach: "Dumbfounded by absolutely undeserved newspaper attacks against you. Your high world-wide acknowledged scientific authority cannot be shaken. I hope definitely that you will find the inner forces to face this inauthoritative criticism of your contributions calmly. I avoid mentioning the completely groundless accusations of the other sort.

Lebesgue's letter of August 5, 1936 is in order now. I remind that H. Lebesgue was elected in 1929 to the Academy of Sciences of the USSR for his outstanding contribution to mathematics. The great Lebesgue, the author of that very "Lebesgue integral" which is indispensable in modern mathematics, was in the state of utmost indignation and anger. He wrote (cp. [13, p. 127]):

You will see that it was not yesterday when the attacks on Luzin began with the aim of firing him and emptying place for Aleksandroff. You will see there that I was already mixed in this by contrasting "my" science, which is bourgeoisie and useless, to *analysis situs* [topology], a proletarian and useful science. Since the former was the science of Luzin; whereas the latter, the science of Aleksandroff. What is curious is that he begins as Urysohn whose papers he inherited at the same starting point that was mine. With the only difference that Urysohn cited me whereas Aleksandroff has never cited me anymore since he must now speak badly of me in his struggle against Luzin!

Another evidence of W. Sierpiński is as follows (cp. [13, p. 125]):

I share the opinion and the same opinion is shared by my Polish colleagues that the presence of Aleksandroff, Khinchin, Kolmogorov, and Shnirelman who confronted their former teacher in the most dishonest manner and slanderously accused him is intolerable at any meeting of decent persons.

The method of political insinuations and slander was used against the old Muscovite professorship many years before the *Pravda* article. The declaration of November 21, 1930 of the "initiative group" of the Moscow Mathematical Society which consisted of L. A. Lyusternik, L. G. Shnirelman, A. O. Gelfond, and L. S. Pontryagin and K. P. Nekrasov claimed (cp. [10] and [20]):

The acrimonious class struggle in the USSR has pushed the right-wing professoriate into the camp of the counter-revolution. The reactionary professoriate headed all sabotaging organizations and counter-revolutionary parties that have been disclosed recently. Owing to the meritorious actions of the *OGPU*<sup>15</sup> there are divulged the crimes of the whole bunch of scientific bonzes who can artfully hide themselves under various masks— from that of cold loyalty to Soviet power to highly-advertised profound affection to Soviet power. Even in the community of mathematicians some active counter-revolutionaries were revealed. Under arrest for participation in a

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<sup>15</sup>This is the standard abbreviation in Russia of the political police of those years which was called the United State Political Department.

counter-revolutionary organization is Professor Egorov, the undisputed leader of the Moscow mathematical school, the Chairmen of the Moscow Mathematical Society, the former Director of the Mathematical Institute, and the candidate of Moscow mathematics to the Academy of Sciences—the very same Egorov, the savior of the academic traditions, whom the proletarian student body had been struggling against for a long time but whose defence was a practically unanimous decision of the community of Moscow mathematicians.

D. F. Egorov (1869–1931) was the teacher of Luzin. Shortly before D. F. Egorov had been arrested, and Luzin decided it wise to leave the university (he was later accused of this removal by his students).

In his life's-description, dated as of the late 1970s, L. S. Pontryagin asserted (cp. [21, p. 91]):

The two public actions, in 1936 as regards Luzin and in 1939 as regards elections, were the important stages of my uprising as a public person. In my opinion both were the struggle for rightful ends.

This is totally inconsistent with the position of Luzin who wrote in his letter of 1934 to L. V. Kantorovich (1912–1986) after the ugly declaration signed by A. O. Gelfond that his choice in Moscow for the forthcoming election of corresponding members of the Academy “will be Gelfond who has recently made a discovery worthy of a genius” (cp. [22]).

And in 1939 Luzin wrote to V. I. Vernadsky about his offenders (cp. [19, p. 105]):

Vladimir Ivanovich, the candidates in mathematics—Sobolev and Kolmogorov—are good. I will vote for them.

A broad campaign against Luzin and “Luzinism” waged over this country in 1936 (cp. [24, p. 757–767]). Fortunately, Luzin was not repressed nor expelled from the Academy. Some historians opine that there was a relevant oral direction of I. V. Stalin.<sup>16</sup> But the badge of an enemy under the mask of a Soviet citizen was pinpointed to Luzin during 14 years up to his death. The monstrosity over Luzin is absolutely incomparable with the alleged accusations of moral misconduct.

#### MATHEMATICAL ROOTS OF THE LUZIN CASE

The human passions and follies behind the 1930s tragedy of mathematics in Russia are obvious: love and hatred, jealousy and admiration, vanity and modesty, generosity and careerism, etc. But was there a mathematical background? Some roots are visible.

We are granted the blissful world that has the indisputable property of unicity. The solitude of reality was perceived by our ancestors as the ultimate proof of unicity. This argument resided behind the incessant attempts at proving the fifth postulate of Euclid. The same gives grounds for the common search of the unique best solution of any human problem.

Mathematics has never liberated itself from the tethers of experimentation. The reason is not the simple fact that we still complete proofs by declaring “obvious.” Alive and rather popular are the views of mathematics as a toolkit for natural sciences. These stances may be expressed by the slogan “mathematics is

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<sup>16</sup>It was disclosed recently that the above-mentioned letter of P. S. Kapitsa to V. M. Molotov was multiplied in 16 copies for the members of the Political Bureau of the All-Union Communist Party (Bolsheviks) and discussed over with other letters in support of Luzin.

experimental theoretical physics.” Not less popular is the dual claim “theoretical physics is experimental mathematics.” This short digression is intended to point to the interconnections of the trains of thought in mathematics and natural sciences.

It is worth observing that the dogmata of faith and the principles of theology are also well reflected in the history of mathematical theories. Variational calculus was invented in search of better understanding of the principles of mechanics, resting on the religious views of the universal beauty and harmony of the act of creation.

The twentieth century marked an important twist in the content of mathematics. Mathematical ideas imbued the humanitarian sphere and, primarily, politics, sociology, and economics. Social events are principally volatile and possess a high degree of uncertainty. Economic processes utilize a wide range of the admissible ways of production, organization, and management. The nature of nonunicity in economics transpires: The genuine interests of human beings cannot fail to be contradictory. The unique solution is an oxymoron in any nontrivial problem of economics which refers to the distribution of goods between a few agents. It is not by chance that the social sciences and instances of humanitarian mentality invoke the numerous hypotheses of the best organization of production and consumption, the most just and equitable social structure, the codices of rational behavior and moral conduct, etc.

The twentieth century became the age of freedom. Plurality and unicity were confronted as collectivism and individualism. Many particular phenomena of life and culture reflect their distinction. The dissolution of monarchism and tyranny was accompanied by the rise of parliamentarism and democracy. Quantum mechanics and Heisenberg’s uncertainty incorporated plurality in physics. The waves of modernism in poetry and artistry should be also listed. Mankind had changed all valleys of residence and dream.

In mathematics the quest for plurality led to the abandonment of the overwhelming pressure of unicity and categoricity. The latter ideas were practically absent, at least minor, in Ancient Greece and sprang to life in the epoch of absolutism and Christianity. G. Cantor (1845–1918) was a harbinger of mighty changes, claiming that “*das Wesen der Mathematik liegt gerade in ihrer Freiheit.*” Paradoxically, the resurrection of freedom expelled mathematicians from the Cantor paradise.

Nowadays we are accustomed to the unsolvability and undecidability of many problems. We see only minor difficulties in accepting nonstandard models and modal logics. It does not worry us that the problem of the continuum is undecidable within Zermelo–Fraenkel set theory. However simple nowadays, these stances of thought seemed opportunistic and controversial at the times of Luzin. The successful breakthroughs of the great students of Luzin were based on the rejection of his mathematical ideas. This is a psychological partly Freudian background of the Luzin case. His gifted students smelled the necessity of liberation from description and the pertinent blissful dreams of Luzin which were proved to be undecidable in favor of freedom for mathematics. His students were misled and consciously or unconsciously transformed the noble desire for freedom into the primitive hatred and cruelty. This transformation is a popular fixation and hobby horse of the human beings through the ages.

Terrible and unbearable is the lightheaded universal fun of putting the blame entirely on Luzin for the crimes in mathematics which he was hardly guilty of with

the barely concealed intention to revenge his genuine and would-be private and personal sins. We should try and understand that the ideas of description, finitism, intuitionism, and similar heroic attempts at the turn of the twentieth century in search of the sole genuine and ultimate foundation were unavoidable by way of liberating mathematics from the illusionary dreams of categoricity. The collapse of the eternal unicity and absolutism was a triumph and tragedy of the mathematical ideas of the first two decades of the last century. The blossom of the creative ideas of Luzin's students stemmed partly from his mathematical illusions in description.

The struggle against Luzin had mathematical roots which were impossible to extract and explicate those days. We see clearly now that the epoch of probability, functional analysis, distributions, topology began when the idea of the ultimate unique foundation was ruined for ever. K. Gödel (1906–1978) had explained some trains of thought behind the phenomenon, but the mathematicians par excellence felt them with inborn intuition and challenge of mind.

It was Luzin whom the vision of the Moscow schools of today had started with. Luzin was interested in foundations, and description for him was the method of understanding the whole of mathematics. Sprang to life as the theory of measurability, description has not passed away—it is alive in recursive analysis and other ideas related to computability and the Church thesis.

Description plays the same role in regard to finitism and intuitionism as absolute geometry plays in regard to elliptic and hyperbolic geometries. The procedures and ideology of description are the forerunners of the ideas of computability and algorithm. The creative contribution of A. N. Kolmogorov into algorithm theory, computability, and complexity comprises the component that stems from description. Probability theory, turbulence, and analysis constitute the component that is rooted in the refusal from description. Mathematics reduces to neither finitism, nor intuitionism, nor description. It is not categorical—it is free. In the twentieth century the freedom of mathematics was best demonstrated in Russia by A. N. Kolmogorov, a student of Luzin and the teacher of new generations of mathematicians in this country. He harbored more freedom in mathematics, which made him a greater mathematician.

It is the tragedy of mathematics in Russia that the noble endeavor for freedom had launched the political monstrosity of the scientific giants disguised into the cassocks of Torquemada.

#### A FEW LESSONS

History and decedents are out of the courts of justice. Scientists and ordinary persons must see and collect facts. Never accuse the passed away, but calmly and openly point out that which was in reality. Explain the difference between moral accusations and political insinuations to the youth. Demonstrate the difficulty and necessity of the repairing of mistakes and repentance. Show how easy it is to forgive oneself and accuse the others.

We must work out and transfer to the next generations the objective views of the past. Of its successes and tragedies. With love and doubts, with the understanding of our unfortunate fate and the honor of objectivity. It is the personal faults and failures that we are to accuse and repair first of all. They knew even in Ancient Rome that we should tell nothing or good about the dead. Facts did never pass

away. Luzin was accused by the community of Moscow mathematicians as well as by the Academy of Sciences.

The defence of Stalinism consists often in proclaiming that the ugly misdeeds and crimes of Stalinism are the fault of Stalin, Beriya, Mekhlis, Kolman, and the hord of their minor clones and replicas, while in fact Stalinism was created by millions. Stalinism in science was mainly raised by scientists themselves. It is indecent to pretend that Luzin's students safeguarded their teacher and science from Stalinism. Luzin was a victim of social ostracism and lived with the brand and stigma of an adversary with a Soviet mask during fourteen years up to his death. He became an exemplary outcast for Stalinism—an adversary at large. Luzin's colleagues and students lowered and neglected him, which culminated in slapping in his face and spitting on his tomb. Luzin has passed away but the false accusations in sabotage and obsequiousness are still effective.

We cannot forget the words of Luzin (cp. [1, p. 73]):

As regards the last paragraph of the article in *Pravda* where the monstrous accusations were made against me in servitude to the present-day masters of fascistoid science, I state with the full understanding of my political responsibility of a scientist of international reputation and a citizen of the USSR that the Editorial Board of *Pravda* was deliberately misled to delusion by the persons who had informed it about this. This is refuted by my whole life and activities as a scientist and a person.

Any attempt at discerning morality in the past immorality is dangerous since it feeds this immorality by creating the comfortable environment of immorality in the present and future. The stamina of a scientist by belief is a discontinuous function. Science does not inoculate morality. Evil and genius coexist from time to time.

History is a branch of science, but science goes hand in hand with conscience. Therefore history is not only a scientific discipline but also a matter of responsibility of the present. No one can change the history; but we, the humankind, are not indifferent onlookers on the past. History is not anything existant without people. The past is the past of the present and as such it is part of the present-day responsibility. The alive rather than the dead are responsible for what was done in the past. It is we who change life so creating the future. History awakens upon our conscience and hits in our hearts alike the ashes of Claes' did in Till Eulenspiegel's.

#### EPILOG

The Presidium of the Russian Academy of Sciences dismissed the Luzin case by Resolution No. 8 of January 17, 2012:

This act annuls the Resolution of the Presidium of the Academy of Sciences of the USSR of August 5, 1936 (Protocol 16).

The decision followed the appeal to the Presidium of the Russian Academy of Sciences signed by A. A. Borovkov, V. E. Zakharov, I. A. Ibragimov, V. E. Nakoryakov, A. K. Rebrov, and Yu. G. Reshetnyak on July 7, 2011.

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