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THE MOSCOW MATHEMATICAL SOCIETY AND THE DEVELOPMENT OF MATHEMATICS IN RUSSIA (ON THE 150TH ANNIVERSARY OF THE SOCIETY'S CREATION)

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The Moscow Mathematical Society — the oldest mathematical society in Russia, and one of the oldest in the world — was established one hundred and fifty years ago, in the Autumn of 1864. Its foundation was one of the most significant events in the development of mathematics in Russia, testifying to the creation in the country of a mathematical community that needed special forms of organization for its activities. It should be noted that this was not the first attempt to organize a mathematical society in Moscow: already in 1810, a group of teachers and students at Moscow State University had tried to establish a similar society; see [**1**, p. 316] and [**2**]. However, it existed only very briefly: a sufficiently large community of active professional mathematicians had not yet formed in the ancient capital to maintain its regular activities. Until the mid-1830s, Moscow was, in relation to mathematics, profoundly provincial, significantly inferior to St. Petersburg, in which the Imperial Academy of Sciences was located, and Kazan', workplace of N. I. Lobachevskiĭ (see [**1**]. But by as early as the middle of the nineteenth century, the works of N. D. Brashman and N. E. Zernova of Moscow had become notable points on the mathematical map of Europe.

§ 1. The birth of the Moscow Mathematical Society

The 1860s were the time of the reforms of Alexander II, which radically changed the face of the country. The most prominent of these reforms was the abolition of serfdom. The system of public education underwent substantial transformations. Under the new liberal statutes, school and university life was democratized. This encouraged the organization of university scientific societies. And it was quite natural that in the old capital, where mathematical activity was on the rise, the idea of creating the first Russian public mathematical organization should be born. Its realization began in 1864 with the creation of the circle that initially received the name the Society of Lovers of Mathematical Sciences. It was with this that the history of the Moscow Mathematical Society began.[1] Among the first 14 members of the society, we see the Moscow professors N. D. Brashman, F. A. Bredikhin, N. V. Bugaev, A. Yu. Davidov, A. V. Letnikov, N. A. Lyubimov, F. A. Sludskiĭ, V. Ya. Tsinger, academician P. K. Chebyshëv (one of the greatest mathematicians of the second half of the nineteenth century, then living in St. Petersburg), and K. M. Peterson, a humble teacher at the Moscow German gymnasium, later famous for his geometrical studies.

[1]The London Mathematical Society was founded in 1865, the Société mathématique de France in 1872, the Circolo Matematico di Palermo in 1884, the New York Mathematical Society (which served as the basis for the American Mathematical Society) in 1888, and the Deutsche Mathematiker-Vereinigung in 1890. Of the currently existing societies that are older than the Moscow one, we name the Koninklijk Wiskundig Genootschap, the Dutch Mathematical Society, founded in 1778.

The first meeting of the circle[2] took place on 18 (27) September 1864 in Brashman's apartment; he was by this time retired and, for health reasons, could not attend the university.

"The members distributed amongst themselves all studies relating to essential activities of members of the Society" and it was decided to cover these studies with regular reports, both abstracts and pieces containing original results. It was decided to hold meetings once a month. A. Yu. Davidov was elected vice president, V. Ya. Tsinger secretary, and N. D. Brashman — a notable mathematician and pedagogue, and a corresponding member of the St. Petersburg Academy of Sciences [5] — was elected president of the Society.

It is impossible to overemphasize the role of Brashman (1796–1866) in the history of Russian mathematics. A native of Moravia, coming from a wealthy Jewish family belonging to the merchant class, he received a mathematical education at the Vienna Polytechnic Institute (one of the authors of the present article managed to find in the archive of this institute a document in which he is referred to as the Jewish student Ignatius Brashman) and Vienna University, where he attracted the attention of the famous astronomer Professor I. S. Litrov. Realizing that in the conditions of Vienna the capable youth was unlikely to be able to build a successful career, he suggested to Brashman that he try his luck in Russia, in which country he had worked as a professor at Kazan' University from 1810 to 1816, and had become a corresponding member of the St. Petersburg Academy of Sciences. Carrying letters of recommendation, Brashman arrived in St. Petersburg in 1823, where he began to teach at the Petropavlovsk school. During this period, he had already indicated his religion as Lutheran (he later converted to Orthodoxy). In 1825, he was appointed adjunct in physico-mathematical sciences at Kazan' University, where his sponsor Litrov had once worked; Litrov apparently continued to help Brashman, using his old contacts. At the beginning of the 1834/35 academic year, he transferred to Moscow University, where he took the chair of applied mathematics. It is here that his brilliant scientific and pedagogical activities unfolded. He educated a whole galaxy of remarkable students, among whom we name P. L. Chebyshëv, highly regarded by his teacher.

We note that two dates of foundation can be found in the literature on the history of the Society — 1864 and 1867. The first is the actual beginning of the work of the Society, the second the year of its official approval by the tsar. As stated in "Materials for the history of the Moscow Mathematical Society", published in volume 14 of *Matematicheskiĭ sbornik* [3, p. 471]: "The charter of the Moscow Mathematical Society was approved in accordance with the law on 28 January 1867. The official existence of the Mathematical Society begins from this date. But in fact the Society came into being on 15 September 1864 and had existed from this time continuously and actively in the form of a private circle; moreover, it was already at this time an entirely proper organization, having published the first volume of *Matematichekiĭ sbornik*, having gathered for its activities on certain dates, and having held its meetings with proper protocols."

These protocols, as a rule, were signed by the president, the vice president and the secretary. From the first meeting of 15 September 1864 to the meeting of 19 March 1866, these were, respectively, Brashman, Davidov and Tsinger. But the protocol of 15 October 1866 was signed by the new president Davidov, the vice president Tsinger, and the secretary M. F. Khandikov. Indeed, these three persons were re-elected to

[2]The circle became known as the Moscow Mathematical Society on 6 January 1866 — see [3, p. 480] — when it was decided "to submit an application for the approval of the Society according to law", and a new draft of the Society charter was approved. In January 1867, the Society was officially approved [4, p. III].

these same posts in 1867 after the official approval of the Society (see the excerpts from the protocols of the meetings of the Moscow Mathematical Society of 18 February, 18 March and 22 April 1867 in [4, p. VII]). Thus, the transition of the Society to a "legal" status (a term that we have borrowed from the protocols of the Society of 19 November 1866 [3, p. 485]) did not bring about any noticeable change in its activities. In modern historiography (see [1, 6, 7, 8, 9]), preference is given to the first date. We also believe that it is natural to take the Society's year of birth as 1864.[3]

Initially, the Society had very modest goals for its activities: "The purpose of the Society" — we read in the protocols of its first meeting [3, p. 472] — "is the mutual support of the matematical sciences in the classroom". However, as soon became clear, its leaders had set before the Society some significantly more ambitious targets. In its new charter, approved in January 1867, we read: "The Moscow Mathematical Society is established with the goal of promoting the mathematical sciences in Russia" [4, p. III].

At the fourth meeting of the Society of 15 December 1864, Brashman had already expressed an opinion on the desirability of publishing the lectures read at the meetings, and in April 1865 it was decided to publish a Society journal — the already-mentioned *Matematicheskiĭ sbornik*. There was a discussion about the language in which the journal should be published. Some members believed that it would be appropriate to publish it in one of the main world mathematical languages — then German and French — in order for the results published therein to become known in Europe. The winning point of view, however, was that of Bugaev, who believed that the main purpose of the new journal should be to promote mathematical research and mathematical culture at home. The journal was therefore published in Russian. The preparation of the first volume of *Matematicheskiĭ sbornik* was directed by Brashman himself, although he did not live to see its publication. The first volume appeared in October 1866 with a portrait and biography of N. D. Brashman. The publishers decided "to dedicate the first volume to the memory of the late president Nikolaĭ Dmitrievich Brashman, to abandon the sum promised by the university, and make the payment from its own resources" [3, p. 484]. It must be said that for a long time (up to 1896, when the journal had acquired an international reputation and funds for its publication were allocated by the Ministry of Education) the journal was published at the expense of the members of the Society and various subsidies (such a subsidy was one time procured by Chebyshëv [1, p. 317], sometimes helped by the university). Thus began the history of one of the most influential mathematical journals of the twentieth century [7].

§ 2. The Society at the turn of the century

The last third of the nineteenth century, and the beginning of the twentieth, was a period of active development of the Society. And if in the year of its creation it totalled just 14 members, of whom only one was a foreigner, then on the eve of the First World War, it consisted of 112 members, 34 of whom lived in Moscow, 57 in other cities of the Empire, and 21 were foreign members. Thus, the activities of the Society had taken on a nationwide and even international character.

The role of the activities of the Society in the development of the mathematical sciences in the Empire was critical. "In its significance", wrote A. P. Yushkevich [1, p. 317], "the Moscow Mathematical Society was second only to the Academy of Sciences". From the topics of the lectures delivered at the meetings of the Society, and the fact that the speakers were scientists from different cities (information on them was published in the pages of *Matematicheskiĭ sbornik*), one can assess the evolution of mathematical research

[3]In Autumn 2014, the Moscow Mathematical Society held a special meeting at Moscow State University to mark its 150th year [9].

throughout the whole country. What speaks to the importance attached to the Society by Muscovites is the fact that prominent scientists were always elected to its leadership — its first presidents were: N. D. Brashman in 1864–1866, A. Yu. Davidov in 1866–1886, V. Ya. Tsinger in 1886–1891, N. V. Bugaev in 1891–1903, P. A. Nekrasov (1858–1924) in 1903–1905, N. E. Zhukovskiĭ (1847–1921) in 1905–1921, and B. K. Mlodzeevskiĭ (1858–1923) in 1921–1923. The list of subsequent leaders of the Society (reproduced below) is even more impressive.

And, of course, the Society played a decisive role at the turn of the twentieth century in the transformation of Moscow into an important European centre of mathematical research, known for achievements in the fields of applied mathematics (Zhukovskiĭ, S. A. Chaplygin) and differential geometry (Peterson, Mlodzeevskiĭ, D. F. Egorov), and also for interesting results in projective geometry (K. A. Andreev, A. K. Vlasov), number theory (Bugaev), and the theory of functions of a complex variable (Nekrasov).

At this time, the studies of Muscovites were characterized by an interest in applications, a predisposition towards geometry and pure geometrical constructions, and also the pursuit of philosophical reflections on the subject matter and methods developed in the name of mathematics. At the same time, an interest in idealistic and even religious philosophy became dominant. This interest became the basis for the consolidation of the Moscow "philosophico-mathematical" school of this period [10].

The most influential Moscow mathematician at this time, N. V. Bugaev, became the leader of this school. An original philosopher, he became the author of his own philosophical system — "evolutionary monadology". His philosophical ideas were developed in the writings of such famous philosophers as P. A. Florenskiĭ and A. F. Losev, but, more importantly for us, they became the basis for the special interest in Moscow in discontinuous functions. Bugaev regarded the creation of a theory of such functions to be one of the most important problems of modern mathematics and tried, together with his students, to solve it within the framework, developed by them, of "arithmology" [11], the kernel of which consisted of the study of number-theoretic functions.

The activity of the Moscow philosophico-mathematical school proceeded in bitter conflict with that in St. Petersburg (then better known in Europe), or, as it is often called, the Chebyshëv school (A. A. Markov, A. M. Lyapunov, and others). The basis for this confrontation was first of all an ideological disagreement that to a certain extent shaped the mathematical orientation of the capital's schools: positivism, liberal democracy and antimonarchism dominated the Petersburg environment on the one hand, while militant antipositivism, enthusiasm for idealistic and even religious philosophy, Orthodoxy and monarchism were inherent to Muscovites on the other [11].

The confrontation between the mathematicians of the two capitals left an imprint on the lives of the whole Russian mathematical community of the last third of the nineteenth and first third of the twentieth centuries, creating a certain tension. (We must not forget that an overwhelming majority of the professors at provincial universities — Khar'kov, Kiev, Novorossiĭsk, Warsaw, Yur'ev — were graduates of Moscow and St. Petersburg Universities.) This tension led to conflicts, often ending in open clashes. This happened, for example, in connection with the discussion of a method of finding rational integrals of linear differential equations with integer coefficients proposed by V. G. Imshenetskiĭ in papers of 1887–1891. These works, which provoked criticism from Markov and K. A. Posse, were supported by Muscovites — Andreev, Nekrasov, and others. Posse, A. N. Korkin and D. K. Bobylëv appealed by letter to the Moscow Mathematical Society. At the meeting of the Society of 19 May 1892, this discussion concluded with a fierce clash, which led on 24 May to the death of Imshenetskiĭ from heart failure. Another example of a similar situation is the criticism by Markov of the famous 1888 results of

S. V. Kovalevskaya concerning the integrals of the equations of motion of a rigid body about a fixed point. The Muscovites again took Kovalevskaya's side. All these conflicts were discussed at meetings of the Moscow Mathematical Society, which served as an arbiter. What is clear here is the special role of the Society, so important in the period of formation of the Russian mathematical community — the role of organizer of the community, of a *society* organization, moreover, an organization whose activities were not those of a local (Moscow!), but nationwide, character.

Of course, an especially important role was played by the Society in the development of mathematical investigations in Moscow itself, which grew from a barely noticeable European centre of mathematical study into one of the world's leading mathematical capitals.

§ 3. The creation of the Moscow school of function theory

Naturally, the Muscovites were not happy with the situation of the community, stigmatized by academic St. Petersburg. They were looking for the theme whose development would allow them to reach the forefront of current research. At the same time, this theme was to be as far as possible from those developed by the mathematicians of the northern capital. And they found such a topic — it turned out to be a new theory of functions of a real variable, which originated in the 1890s in the work of the French mathematicians É. Borel, H. Lebesgue and R.-L. Baire. On the basis of G. Cantor's theory of sets, these works built a new theory of discontinuous functions, the goal attempted unsuccessfully in the arithmology of Bugaev and his students. One of their authors, D. F. Egorov (1869–1931), even started his scientific career with work on arithmology. However, being a mathematician with great intuition, he quickly became disillusioned with Bugaev's arithmology, and chose a differential-geometric direction, developed in Moscow by Peterson, as the theme of his further studies. Along the way, he met with success: In 1899 he defended his master's dissertation *Second order partial differential equations in two independent variables. General theory of integrals, characteristics*, and in 1901 his doctoral dissertation *On a class of orthogonal systems*. The main results of the doctoral dissertation were included in the second edition of the famous treatise of G. Darboux, *Leçons sur les systèmes orthogonaux et les coordonnées curvilignes*; Darboux named the class of E-surfaces in his honour. However, Egorov did not forget the arithmological theme of his youth — the theory of discontinuous functions [12]. Having become acquainted with the theory of functions of a real variable of the young French mathematicians, he immediately saw in it a trace of the late Bugaev's theory of discontinuous functions and became interested. In 1911, there appeared a note "On sequences of measurable functions" in the *Comptes Rendus* of the French Academy of Sciences, containing a theorem now known as Egorov's Theorem, and as early as 1912 in the same journal an article by his student N. N. Luzin (1883–1950) "On a basic theorem of integral calculus" on the C-property. Thus began the history of the famous Moscow school of function theory, or, as it is often called, the Egorov–Luzin school. Its growth was rapid, with striking successes. In 1915, Luzin's famous work *Integral and trigonometric series* was published; this contained not only his own achievements but also results of one of the first of his students, A. Ya. Khinchin. In the years before the revolutionary events of 1917, Luzin and his students — Khinchin, D. E. Men'shov, P. S. Aleksandrov, M. Ya. Suslin — had already obtained results that announced the appearance in Moscow of one of the most prominent schools of modern Europe.

Of course the Moscow Mathematical Society played an essential role in the development of this success. The problems of set theory and the theory of functions of a real variable occupied a special place in its work, as well as in the activities organized by

the Society in 1902 for the student mathematical circle [13, 14]. The initiator and first secretary of the circle was Florenskiĭ, and his successor was Luzin. The Society had become a platform on which the history of the new school was created. The results of its leader Luzin were discussed there, as well as the most important achievements of his students. Reports were made either by Luzin or by the authors themselves. Thus, in a report of 1905, he communicated an example from Men'shov of a trigonometric series, not all of whose coefficients are equal to zero, but whose sum is zero, and also a theorem of Aleksandrov on the cardinality of a B-set, and in a lecture of 1916, he communicated a basic result of Suslin. In 1914 and 1916, Men'shov delivered an address at a meeting of the Society, as did Khinchin in 1915 and 1916 [15].

§ 4. The revolution and the first years of Soviet power

Of particular importance were the activities of the Society in the years 1917–1923, which were difficult for science and education. In February 1917, the February Revolution took place, its principal result being the overthrow of tsarism. And in October, the further October Revolution brought the Bolsheviks to power. Finally, immediately after the October Revolution, there blazed the fire of civil war. All these events took place at a time when Russia waged active military operations in the fields of battle of the First World War. Throughout this period, university life only flickered — difficulties with food and fuel forced many teachers to leave the city. Nevertheless, the meetings of the Society continued; all mathematicians gathered who at the time still found themselves in the city. The president of the Society remained in Moscow throughout the difficult period. And the Society had assumed the role not only of the organizer of Moscow mathematical life, but also as one of the founders of the national (now Soviet) mathematical community. This role was facilitated by the transfer in 1918 of the capital from Petrograd (as St Petersburg had been known since the beginning of the war with Germany) to Moscow. An important fact is that in 1923, Egorov — the outstanding mathematician and remarkable organizer — became president of the Society [12].

First if all, Egorov set about resuming the publication of *Matematicheskiĭ sbornik*. An editorial board was created for the management of the journal: Egorov (executive editor), V. A. Kostitsyn (scientific secretary), Luzin and Mlodzeevskiĭ. The old and sick Mlodzeevskiĭ became a member of the editorial board due to his position — he was then president of the Society. Kostitsyn[4] — who was, on the one hand, a student of Egorov, and, on the other, a member of the Party, and an employee of Glavnauka and Narkompros — became a figure who was entirely necessary for the uninterrupted output of the journal under the Soviet publishing system. The journal started to be published by Gosizdat, with funds allocated by the state. Its 31st volume was released in 1924 [7].

Taking account of the evolving situation in Soviet science, Egorov changed the nature of the journal, transforming it into an all-Union, even international, publication. For the 32nd volume of the journal, V. A. Steklov — leader of the Leningrad mathematical school, under the established tradition of opposition to the Muscovites — was added to the editorial board. Moreover, from this volume, the journal was declared the organ not only of the Moscow, but also of the Leningrad and Kazan' Mathematical Societies.

[4]V. A. Kostitsyn (1883–1963) was the author of a series of results in the theory of integral equations, and also in applied mathematics. He was an astrophysicist and geophysicist. He gave a correct mathematical forecast of the nature of the Kursk magnetic anomaly. A participant in the revolution of 1905–1907, he was a member of the Russian Social Democratic Labour Party. In Soviet times, he held prominent positions in Soviet scientific and educational institutions. In 1928, he emigrated to France. He is widely known for his results on the application of mathematics in biology, in particular, those obtained in conjunction with V. Volterra. See: V. A. Kostitsyn, *The evolution of the atmosphere, biosphere and climate*, Moscow, 1989 (Russian).

Besides Russian, the official languages of the journal became German, French, Italian and English. As a result of the need for scientific periodicals that arose after the First World War in Europe, Egorov's initiative proved to be extremely popular. Amongst the authors in *Matematicheskiĭ sbornik* from 1920 to the early 1930s, we see J. Hadamard, B. Gambier, S. Lefschetz, É. Cartan, R. von Mises, E. Noether, W. Sierpiński, L. Tonelli, M. Fréchet, and H. Hopf.

Central to the Soviet mathematical community, which was just beginning to form, was the emergence of an all-Union press organ aimed at a broad international cooperation. Besides the work of Muscovites, the journal also published the work of Leningraders (A. S. and Ya. S. Bezikovich, N. M. Günter, L. V. Kantorovich, I. A. Lappo-Danilevskiĭ, S. L. Sobolev, G. M. Fikhtengol'ts, V. A. Fok), and also of mathematicians from other cities across the country — Kazan' (N. G. Chebotarëv), Rostov-on-Don (D. D. Mordukhaĭ-Boltovskiĭ), Kiev (D. A. Grave, N. M. Krylov), and Odessa (M. G. Kreĭn).

Another important initiative of Egorov as president of the Moscow Mathematical Society, aimed at strengthening the national mathematical community, was the organization and hosting in Moscow in the Spring of 1927 of an All-Russian Congress of Mathematicians [16]. This congress, of which Egorov was elected chairman, gathered 378 participants from 33 cities of the Soviet Union (from Leningrad to Tiflis and Baku, from Minsk to Perm in the European part, from Omsk to Tashkent and from Tomsk to Vladivostok in the Asian part). It was decided at the congress to set up an All-Union Association of Mathematical Institutions, and a council for this body was elected, which took over the publication of the congress proceedings, carried out in 1928, and the preparation of the First All-Union Congress of Mathematicians, held in June 1930 in Khar'kov. Thus the initiative of the Moscow Mathematical Society led to the start of the regular life of the Soviet mathematical community. Having initiated the creation of a new structure — the All-Union Mathematical Association — the Society did not claim a special role for itself, but continued to promote the development of mathematics in Russia. (The Association, however, did not turn out to be viable. Although it continued to exist *de jure* for many years, it had no significant impact on the life of the community, and its demise was not noticed by anyone. The Soviet mathematical community was a stranger to attempts at a full unification in the manner of the organization of a single French Mathematical Society, or the German Association of Mathematicians, or the American Mathematical Society, preferring to develop in the form of an aggregate of regional mathematical societies, within which the special role of the Moscow society was recognized — first amongst equals.)

§ 5. The period of crisis and trials

The Society played an important role in the expansion of the active themes of research of the Moscow school of function theory in the late 1920s and early 1930s, accompanied by its break-up into a set of subsidiary topics. This process was, on the one hand, a testament to the extraordinary life-force of the school and the prospects opening up before it, but, on the other hand, was the cause of the conflict that prevailed between Luzin and some of his students. The complex political atmosphere in which science was immersed in this difficult period of our history led to a situation of an ideological character, which poured out in the "case of Academician N. N. Luzin" [19].

The Bolsheviks, led by V. I. Lenin, considered their coming to power in 1917 as the first step in the unfolding world revolution that would end with the victory of the ideals of communism around the globe. Therefore, they considered the questions of the organization of education and science not as the most urgent, but as being of cardinal importance, and whose solution would begin immediately after reaching this victory.

Therefore matters of secondary and higher education were in complete disorganization and anarchy in this era. Into primary and secondary education there came a new wave of teachers stuffed with a variety of leftist ideas of a new radical pedagogical theory, which plunged the system into a state of chaos. If anything useful continued to be taught in schools, this is explained by the presence of older teachers who continued to teach by the pre-revolutionary programmes and textbooks, and who the new government was forced to tolerate because it was not able to replace them all at once with new Bolshevik teachers [17]. Moreover, it could not quickly get rid of the old regime university professors, whose attitude to the new order was, for the most part, negative. Therefore, what was required from the professors first of all was simply loyalty.

The failure of the Bolsheviks to extend the revolution in Russia to the rest of the world forced them to revise their position, in particular, its relationship to questions of education and science. They began the introduction into the high school teaching body of the red professors, the number of whom was initially very low. Some of these (from mathematics, for example, O. Yu. Schmidt, M. Ya. Vygodskiĭ, S. A. Yanovskaya) were members of the Party (communist, of course, all others being banned). The main emphasis was on proletarian students and their growth into graduate students. There were regular purges amongst the students — the explusion of those students who, upon admission, had hidden their origins in the exploiting classes (that is, people from the families of the nobility, merchants, clergy — the doors of the higher schools were closed to them). (See, for example [18].) Teachers who were suspected of having a disloyal attitude to the Bolshevik regime and to the procedures established by it were persecuted. The fate of such persons could be unenviable — arrest by OGPU, followed by expulsion, deportation to labour camps, or even being shot.

The dramatic episode of the "case of Academician N. N. Luzin" was preceded by another "case", one of the defendants of which was Egorov. In the 1920s and 1930s, he was a central figure in the mathematical life of Moscow: director of the Mathematics and Mechanics Scientific Research Institute of Moscow University, and president of the Moscow Mathematical Society. At the same time, this man of deep faith and strong opposition to the Soviet regime not only refused to hide his political and religious beliefs, but actively spoke out about them [12]. Of course, the Soviet government did not put up with this for long. Egorov became the target of constant attacks of proletarian ideology, which led eventually to his arrest in 1930 in the case, trumped up by OGPU, of the "all-Union counter-revolutionary monarchist organization "True Orthodox Church"" and to his death in Kazan' in 1931 [12].

After Egorov's arrest, the attack on him turned into one on the Society. There was a real threat of its closure [20]. Only the timely actions of the leaders — the "election" for a short time as president of the Party ideologue E. Kol'man[5] (such was the case!),

[5]Ernest Yaromirovich Kol'man (1892, Prague – 1979, Stockholm) graduated from the mathematics department of Charles University in Prague. During the First World War, fighting in the ranks of the Austro-Hungarian army, he found himself in Russian territory and was taken prisoner. In 1917, he joined the Red Army and also the Russian Communist Party (later the CPSU). He was sent by the Comintern to conduct subversive activities to Germany. In 1930, he returned to the USSR, where he began working in the Institute of Red Professors. He headed the Association of Institutes of Natural Science of the Communist Academy. His task in those years was to put scientific research in the USSR onto Marxist-Leninist lines and to fight against hostility to Party ideology. A mathematician by training, Kol'man paid special attention to the situation in the Moscow mathematical circle, where he established a process for fighting both overt and covert counter-revolution. Hence his involvement in the events connected with the "enemy" activity of D. F. Egorov (even taking over his presidency of the Moscow Mathematical Society, though only for a short time), and his participation in the organization in 1936 of the "case of N. N. Luzin" [19]. In 1936–38, he headed the Department of Science of the Moscow City Committee of the CPSU. After being forced out of this post by the arrest of his wife's brothers, he

the adoption by the Society of the declaration of the "initiative group of young Soviet mathematicians" for the reorganization of the Society, "directed against the openly reactionary elements amongst mathematicians, and against the allegedly Soviet position of the bourgeois-democratic fellow-travellers" [7, p. 144] — managed to bring the Society out from under the blow [20]. In 1932, P. S. Aleksandrov (1896–1982) became president of the Society, holding the position until 1964; the vice president was M. Ya. Vygodskiĭ, a Marxist with pre-revolutionary Party experience, who then had an irreproachable reputation as a "red professor" and was at the same time respected in mathematical circles[6] [21].

An indication of the depths of the emerging crisis and the attempts to solve it that were acceptable to the community may be found in volumes 37–38 of *Matematicheskiĭ sbornik*. Released in 1930, volume 37 was reduced to two small issues, the first designated numbers 1–2, and the second as numbers 3–4. They lacked any information about the Society, and the editor-in-chief was the then politically neutral figure of S. A. Chaplygin. In the double issue (numbers 1–2) that followed in volume 38, published in 1931, there were two editors-in-chief: S. A. Chaplygin and M. Ya. Vygodskiĭ. However, the rest of the slim booklet was not particularly different from the preceding ones, unless, of course, we count the lack of foreign authors, despite the fact that linguistic diversity was maintained: of the six component articles, three were in French and one in English. As is clearly demonstrated by the following double issue (numbers 3–4) of volume 38, action was being taken this whole time to give the journal a new image, which would reassure the overseers from scientific party-ideological bodies: a new editorial board was chosen, and new principles defining the content of the journal were established.

The issue begins with an appeal from the editors to the readers, headed as follows: "From the next issue of the journal, *Matematicheskiĭ sbornik* will change its name to *Sovetskiĭ matematicheskiĭ sbornik*". In the appeal, we read: "During the setting of this

worked at the Institute of Philosophy of the Academy of Sciences and taught mathematics at the Moscow Energy Institute. After the war ended in 1945, he was sent to Prague as head of the Department of Propaganda of the Central Committee of the Czechoslovakian Communist Party. In 1948, he was arrested for criticizing the party leadership (P. Slansky and others) and sent back to the USSR, where he served three and a half years in prison. In 1952, he was released and began to work at the Institute of the History of Science and Technology of the Academy of Sciences and taught mathematics at the Moscow Automechanical Institute. In 1959, he was favoured by N. S. Khrushchëv and sent to Czechoslovakia as director of the Institute of Philosophy of the Czechoslovak Academy of Sciences, to which he was elected at the same time. Two years later, he returned to Moscow, where he continued his studies in the history and philosophy of mathematics, as well as being involved in dissident activities. In 1976, he went to Sweden to be reunited with her daughter, and from here he addressed an open letter to L. I. Brezhnev in which he declared his resignation from the Party. In 1982 in New York, he published his autobiographical book, *We Should Not Have Lived That Way*, which claimed to serve as his confession. In this confession, however, there is not one word about the "case of N. N. Luzin", of which, as turned out from archive materials [19], he acted as one of the main organizers. Moreover, when investigating this "case", the well-known French historian of mathematics P. Dugac wrote to Kol'man in Stockholm to ask him about the circumstances surrounding the famous "case" (because at that time, Kol'man had led the Department of Science of the Moscow State Committee of the CPSU, so the Moscow mathematical community would not have been completely alien to him), Kol'man (according to Dugac and A. P. Yushkevich) replied that he could not give Dugac any help because he was then engaged in another matter entirely, and offered to refer the question to the great Soviet historian of mathematics, Yushkevich. In his historico-mathematical works, Kol'man (for example, in his *History of Mathematics in Antiquity* (1961)) acted primarily as a philosopher, trying to subjugate the actual course of the development of science to Marxist doctrine.

[6]M. Ya. Vygodskiĭ (1898–1965) was a historian of mathematics, one of the founders of the Soviet historico-mathematical school, a geometer and a pedagogue, who in those years held an important position in the leadership of the Moscow mathematical community. As a result of ideological intrigues, he was expelled from the Party in the mid-1930s, and lost his influence [22].

number, there occurred a radical reorganization of the Moscow Mathematical Society, the publisher of the journal *Matematicheskiĭ sbornik*. The Mathematical Society persisted until recent times in its caste "academic" character. Leading the Society was Professor Egorov, a reactionary and churchman, who fought against the policies of the Soviet government in the fields of higher education and science, under the flag of protecting 'academic traditions' and 'pure apolitical science' ... Within the Mathematical Society there was created an initiative group for its reorganization ...[7] The Society excluded Egorov and other reactionaries from its ranks,[8] and replenished its membership ...[9] A new constitution drawn up by the Society sets its goal primarily as the turning of Soviet mathematics to the service of socialist construction ... The last management meeting of the Society chose its new elective bodies: the presidium,[10] commissions on research, pedagogical and media work, the editorial boards of the journals *Matematicheskiĭ sbornik* and the mass magazine". As for the "mass magazine", this referred to attempts to create such a publication in the 1930s, from which there arose the series of collections under the title *Uspekhi matematicheskikh nauk*, which we discuss below. This publication was to take on the role of informant on the events in the life of the Soviet mathematical community, in particular on the activities of the Moscow Mathematical Society. The latter until quite recently had been the prerogative of *Matematicheskiĭ sbornik*.

As a result, *Matematicheskiĭ sbornik* has become a journal occupied almost exclusively with the publication of original mathematical works. As to its editorial board, the composition of this was announced as early as numbers 3–4 of volume 38, namely: P. S. Aleksandrov, A. F. Bermant (responsible secretary), M. A. Lavrent'ev, L. A. Lyusternik, V. I. Smirnov, F. I. Frankl', A. A. Kholshchevnikov and N. G. Chebotarëv. The editor-in-chief was O. Yu. Schmidt. This was a well thought out selection of members of the most influential people of the mathematical community of the time. Schmidt, a member of the Party since 1918, was perhaps the only well-known mathematician at this time to hold a position in the Soviet scientific leadership and to go into the offices of the higher Party and state leadership. To Bermant, a qualified mathematician and prominent pedagogue, fell much work in the administration of the expansion of the journal industry over the years. P. S. Aleksandrov, M. A. Lavrent'ev, L. A. Lyusternik, V. I. Smirnov, F. I. Frankl' and N. G. Chebotarëv were all major mathematicians, each of whom has left a bright mark in the history of our science. For the modern reader, the black sheep in this collection is A. A. Kholshchevnikov, who has left no memory of himself in the history of mathematics. However, he was a man who then held a prominent position in Party circles. So his presence on the editorial board is a tribute to the times.

If the first double issue (numbers 1–2) of volume 38 for 1931, "was handled by the previous editorial board, and did not yet reflect the reorganization of the Society", then in the second (numbers 3–4) the new leadership was trying to catch up. (We note here that the initial intention — of renaming the journal *Sovetskiĭ matematicheskiĭ sbornik* — was wisely abandoned.) On the first page, the new editorial board appealed: "Soviet mathematicians, support your journal!". Their call began with the statement of the fact that "amongst the majority of Soviet mathematicians, there has been preserved a tradition of publishling their best work in foreign journals. What is more, there has also been a widely held point of view that sees the publishing of a large number of our works abroad as a positive phenomenon in *overcoming the cultural blockade of Soviet science*".

[7]We have already mentioned the "declaration" of the initiative group.

[8]It was then, apparently, that those who left the Society emigrated abroad.

[9]Young mathematicians of a Soviet orientation were introduced into the membership of the Society, primarily because of the number of graduate students at the time.

[10]It was then, apparently, that the election of Kol'man as president of the Society (mentioned above) took place.

"This view", say the authors of the appeal, "is of course wrong". The main thing for Soviet mathematicians is to play an active part in the building of socialism in their own country. One of its primary tasks is the creation of a journal reflecting the creative nature of the changes taking place within it, "the organizing of Soviet mathematics in the direction of active participation" in this construction. "Soviet mathematics can and should have a journal of international importance. Therefore, we continue to supply as normal foreign summaries of articles written in Russian, and to print articles in foreign languages." Thus, the tendency towards the active involvement of the journal in the context of the development of world mathematics, which was begun by Egorov, continued its development.

The message concludes with the call: "A group of Moscow mathematicians addressed the editors in a letter, in which they undertake to publish their articles, in the first place, in "Matematicheskii sbornik", and appeal to the other mathematicians of the Soviet Union to do likewise".[11]

The following 24 pages of the issue are devoted to the problems facing the Soviet mathematical community in the course of socialist construction. This was a report on the First (and, we note, last) All-Union Conference on the Planning of Mathematics, which took place on 5–9 June 1931 in Moscow, and also the "Resolution on the lecture of Comrade Kol'man, adopted in the closing session of the conference on 9 June 1931", entitled "On the crisis of bourgeois mathematics and on the reconstruction of mathematics in the USSR". In this report, the task was set of constructing a new Soviet socialist mathematics with its "own face, distinct from the face of bourgeois mathematics". "Socialist mathematics" was to be based not on the rotten foundations of the reactionary ideology of a dying class, entering into mathematics through Hilbert's formalism or Brouwer's intuitionism, nor "idealism in the style of the tendencies of the French school of function theory and its offshoots — Sierpiński, Luzin", but on the basis of militant dialectical materialism. (The direction of such a reliable philosophical foundation, Comrade Kol'man, depends, of course, on your agency.) Mathematicians should also have started on the construction on this foundation of a new Soviet socialist mathematics, aimed first of all at solving the problem of "the reconstruction of industry and agriculture", "on the development of productive forces on socialist principles and on strengthening the country's defenses". Along with the unacceptable view of mathematics as a temple of pure abstract thought, it noted the danger of the other extreme — the transformation of mathematics into a science focused exclusively on solving specific practical problems. "The Resolution" spoke "against the utilitarianism, the empiricism and the naked "practicalism" and neglect of theory that are most often merely a cover masking the rejection of the setting of common problems of dialectical materialism in mathematics". And of course it was a natural demand at the time that scientific workers should move from individual to collective methods, to develop socialist competition and increase productivity.

It was assumed that the further course of planning was to be controlled by a special organisation — the Mathematical Committee of the Science Sector of the People's Commissariat. Besides its work on mathematics itself, it was also supposed to involve representatives of industrial, defense, and agricultural organisations (customers), and also Party ideologues, whose task was to supervise the the ideological direction of the selection process, and, if it proved necessary, to correct it in accordance with the general Party

[11] Thus, even before the debates over the "case of Academician N. N. Luzin" of 1936, the requirement that Soviet mathematicians should publish their work in the first place at home, and not in foreign periodicals [19], had already been introduced into the consciousness of the mathematical community.

line. Of course, Comrade Kol'man marked himself out for this role.[12] (Although, as we have said, the "conferences on planning of mathematics" did not take place, the spirit of planning — it suffices to look through the first issues of *Usepekhi matematicheskikh nauk* — was vital for a long time in the atmosphere of Soviet mathematical life.)

The following volume 39 for 1932 is a complete brainchild of a new editorial board with a fully determined editorial policy. In an appeal "From the editors", they referred to the flowering of mathematical research in the USSR, the result of which was that "Soviet mathematics occupies a prominent place in world science". This statement was not ordinary ideological overexposure, but was consistent with the state of affairs — Soviet mathematics had experienced a period of unprecedented growth. A Soviet mathematical school was formed that was one of the world's most important schools of the second half of the twentieth century. Speaking of the publication of the works of foreign mathematicians, the editorial board declared its continuity in this direction with the previous line of the journal. In emphasizing its willingness to place works in the journal on the methodology of the history of mathematics and mechanics (we note that not one such work was published in the journal!), the editorial board responded to the external factors of the science policy of the time — it had to declare its commitment to the ideological precepts of the Party. For ideological purity in scientific life, it closely followed people like Kol'man. Finally, the editors intended the "chronicle" section of *Matematicheskiĭ sbornik* to publish "information on the work of scientific institutions and documents of fundamental importance". This intention, which testified to the desire of the editors to keep *Matematicheskiĭ sbornik* in position as the main organ of the Soviet mathematical community, was not realized. As we have said, such a place was taken by *Uspekhi matematicheskikh nauk*.

January 1936 saw the beginning of the new series, and volume 43 was its first. The journal changed jurisdiction — it derived from the structure of the Moscow Mathematical Society, but became the organ of the Mathematical Group of the Academy of Sciences of the USSR and of the scientific institutions and societies of the People's Commissariat of the RSFSR. That is, from a formal point of view, its status increased. The composition of the editorial board was also changed: in addition to Schmidt and Bermant, it included P. S. Aleksandrov, I. M. Vinogradov, A. N. Kolmogorov, N. N. Luzin, L. A. Lyusternik, B. I. Segal, and V. I. Smirnov.

From the point of view of mathematical content, the policy laid down by Egorov was not changed. It preserved linguistic diversity and welcomed the participation of foreign scientists.

The "Egorov affair" marked the beginning of a new stage in the life of the mathematical community — an openly anti-Soviet position amongst its members was now intolerable.

The "Luzin affair" can be regarded as a further development of the ideological offensive on the Soviet "mathematical front" [19]. Scientists identified the need to place all their research activities under the full ideological control of the Soviet state. And mathematics accepted this lesson and made conclusions from it — it was forbidden to fight against the ideology of the state, it was necessary to comply, but to comply so that ideology, as far as possible, did not interfere with the free development of mathematical thought, but if it did interfere, then this should be to the smallest possible degree, so that "ideology" was recruited, as far as possible, from the circle of people who were compatible with the leaders of the mathematical community. That is, to put up a barrier to people such as Kol'man, but to treat kindly figures such as S. A. Yanovskaya and moreover, to take the

[12]And at the beginning of his career progression, it seems to have embodied his ambitions. This is particularly clearly revealed in his "underground" activities in the organization of the "affair of Academician N. N. Luzin" [19]. Fortunately for Soviet science, these ambitions were not realized.

Marxist–Leninist interpretation of the subject matter and methods of mathematics into their own hands. (One of the outcomes of these efforts was the appearance in 1956 of the three-volume collected work *Mathematics, its content, methods, and meaning*, prepared under the editorship of A. D. Aleksandrov, Kolmogorov, and M. A. Lavrent'ev.)

§ 6. The establishment and triumph of the Soviet mathematical school

By the mid-1930s the Society had become one of the most authoritative organizations in the national mathematical community. Together with the Steklov Mathematical Institute of the USSR Academy of Sciences, which moved to Moscow in 1934, and Mechanics and Mathematics Faculty organized in 1933 within the new structure of Moscow University, it became part of the core around which there began to form one of the leading mathematical schools of the second half of the twentieth century — the Soviet mathematical school.

The Society was distinguished from the two mentioned institutions by one feature: it was not an organization of the state, but of the public. First of all, it played the role of a professional club — the results of the latest domestic and foreign mathematicians were reported and discussed here. But the internal problems of the life of the domestic community were also discussed here: we have already mentioned the debate over of the results of Imshenetskiĭ and Kovalevskaya that took place at meetings of the Society — of mathematicians not of Moscow; we note also the consideration by the Society of the problems of school mathematical education. And in some turning points in the life of the national mathematical community, its social character enabled it to become cutting edge, setting the direction of motion of Russian mathematics.

In the difficult years of the Second World War, when most Moscow mathematicians who had not gone to the front were evacuated to Kazan' and Tashkent (from which they moved first to Ashgabat and then to Sverdlovsk), the Moscow Mathematical Society, consisting of several branches, continued to function, performing a unifying nationwide mission. Thus, the Kazan' branch of the Society, together with the Kazan' Physico-Mathematical Society, held a solemn meeting on 9 February 1942 devoted to the 75th anniversary of its foundation (here the count was taken from 1867 — the year when the Society had received official status, when it had been awarded "highest approval"), with lectures by Aleksandrov, A. Ya. Khinchin, A. N. Krylov, and L. N. Sretenskiĭ [21].

From 1946, the Moscow Mathematical Society began publication of the periodical journal *Uspekhi matematicheskikh nauk*, continuing the tradition of the All-Union Mathematical Association, which had issued non-periodical collections with the same name since 1936 (in all, ten such collections were published — the penultimate in 1941, and the last, from whose title page all mention of the Association had disappeared, in 1944).

Ten issues of the collection *Uspekhi matematicheskiĭ nauk*, published in 1936–1944, began a remarkable experiment, during which a new type of periodical publication was produced (although through no fault of the publishers they were not periodical), designed to unite and organize the mathematical community of a vast country — to discuss new directions in mathematics, defining its modern appearance, on the lives and activities of mathematical institutions in the country and abroad, on new publications and endeavours, on conferences at different levels, on applied research, to remind readers of significant historical dates and prominent creators past and present. A major role in the creation of the series was played by the executive editor L. A. Lyusternik, who managed to attract the greatest contemporary Russian mathematicians, and also first-class foreign specialists (S. Lefschetz, A. Weil, and others).

A central place in the collections was given to a series of articles on the then most urgent questions of mathematics: functional analysis (articles by Soviet mathematicians

L. A. Lyusternik and V. V. Nemestkiĭ, and also translations of works by F. Riesz and J. Radon) in the first issue, on convex polyhedra (B. N. Delone, L. A. Lyusternik, and also H. Minkowski, M. Dehn, E. Helly) and topological groups (L. S. Pontryagin, and also F. Peter and H. Weyl, S. Banach, J. von Neumann) in the second, on algebraic geometry (translations of articles by S. Lefschetz, O. Zariski, A. Weil) in the third, on approximate methods in analysis (D. Yu. Panov, and also L. Vietoris, R. Mellok) and Lie groups (L. S. Pontryagin, and also H. Weyl, B. L. van der Waerden) in the fourth, on random processes (A. N. Kolmogorov, A. Ya. Khinchin, and also W. Feller) and quasianalytic functions (translations of articles by Ch. de la Vallée Poussin and others) in the fifth, on the theory of functions of a complex variable (G. M. Goluzin, M. V. Keldysh, L. I. Sedov, and also R. Nevanlinna, L. Ahlfors) in the sixth, on metric problems of additive number theory (L. G. Shnirel'man, P. P. Romanov, A. Ya. Khinchin, and also I. Schur, P. Erdős, H. Davenport and others) and graphical methods of spatial statics and kinematics (S. A. Kristianovich, and also R. von Mises, R. Mehmke and others) in the seventh, on elliptic partial differential equations (S. N. Bernstein, I. G. Petrovskiĭ, L. A. Lyusternik, H. Lewy, R. Courant together with K. Friedrichs and H. Lewy, W. Feller) in the eighth, on the theory of linear operators in Hilbert spaces (A. I. Plesner, N. I. Akhiezer, and also F. Riesz) and the qualitative theory of differential equations (translations of articles by I. Bendixson, M. Frommer, W. Mayer) in the ninth, finally, on descriptive geometry (L. G. Shnirel'man, D. O. Shklyarskiĭ, and also A. Cauchy, A. Cayley, H. Hopf and others), theory of probability and mathematical statistics (S. N. Bernstein, B. V. Gnedenko, N. V. Smirnov, and also H. Cramér and J. Neyman) in the tenth.

If we add to this the surveys of A. G. Kurosh on problems of the theory of infinite groups (third issue), B. N. Delone on the geometry of positive quadratic forms (third issue), the articles of S. E. Cohn-Vossen on the bending of surfaces in the large (first issue), I. G. Petrovskiĭ on Cauchy's problem in the domain of nonanlytic functions (third issue), N. G. Chudakov on new results in the theory of the distribution of prime numbers (third issue) and Goldbach's problem (fourth issue), the lectures of W. Blaschke on integral geometry (fifth issue), the work of L. G. Shnirel'man on additive properties of numbers (sixth issue), then the reader is presented with a wide panorama of modern mathematics as presented by leading specialists. We note also that it did not lose sight of the problems of applied mathematics — we may add further the series of surveys by S. L. Sobolev and S. G. Mikhlin on mathematical seismology in the USSR (first issue), and S. G. Mikhlin on the mathematical theory of plasticity (third issue).

Most issues had a special section, "Mathematical Problems", offering the reader problems and themes for development.

The collection also included works on the history of mathematics, both ancient (for example, articles by M. Ya. Vygodskiĭ on mathematics in Ancient Babylon in the seventh and eighth issues), and modern — articles by A. N. Krylov and N. G. Chebotarëv on the creativity of J. Lagrange in the second issue. An article by N. G. Chebotarëv on S. O. Shatunovskiĭ, marking the tenth anniversary of his death, also with a historical character, was published in the seventh issue. A decade of the famous topological circle at Moscow University was noted by V. V. Nemetskiĭ in the second issue (1936).

Information on mathematical life in Russia and the world occupied an important position: the notes of P. S. Aleksandrov on the International Topological Conference in Moscow (first issue), of I. S. Kukles on the study of mathematics and mechanics in the Far-Eastern University (first issue), of S. B. Bergman on scientific work on the theory of analytic functions at the Mathematical and Mechanical Institute of Tomsk University (first issue), of M. F. Kravchuk on the work of the Mathematical Institute of the Ukrainian Academy of Sciences (third issue), of N. E. Kochina on a conference on wave resistance

(third issue), of N. G. Chebotarëv on the main directions of research of the Mathematical and Mechanical Institute of Khar'kov University (third issue) and on mathematical life in Kazan' (fourth issue), of A. F. Bermant on the study of the theory of functions of a complex variable (fourth issue) and A. M. Zhuravskiĭ on work on applied mathematics (fifth issue) at the Steklov Mathematical Institute, of V. D. Kupradze on the work of the Mathematical Institute in Tblisi (fourth issue), on the work of the Mathematics and Mechanics Scientific Research Institute of Moscow University (fourth and fifth issues), A. Weil on the mathematical sciences in France (first issue) and in India (second issue), S. Lefschetz on mathematical research in Princeton (first and fifth issues), and others.

An important place was reserved for personalities. The following notes marked anniversaries of scientists: J. Hadamard's 70th birthday in the second issue (articles by Petrovskiĭ and Sobolev, and also by Gel'fond and Shnirel'man), the 50th year of the pedagogical activities of D. A. Grave in the third issue (a note by Chebotarëv), S. N. Bernshteĭn's 60th birthday in the eighth issue, and obituaries of S. E. Cohn-Vossen (first issue), E. Noether (second issue), G. V. Kolosov (fourth issue), L. G. Shnirel'man (sixth issue), P. M. d'Ocagne (seventh issue), D. A. Grave, V. I. Glivenko and E. A. Naryshkina (eighth issue).

Every issue (except the last) concluded with a "Bibliography" section containing reviews of the mathematical literature: scientific and educational.

Unfortunately, the publication of the first series of issues of *Uspekhi matematicheskikh nauk* was prevented by adverse external conditions: if initially two of its issues came out in 1936, with one in 1937, two in 1938, one in 1939–1940, and two in 1941, then the last of the ten came out only in the year before the end of the war, 1944. Nevertheless, this publication played a prominent role in the development and consolidation of the Soviet mathematical community at this difficult time for the country. It served as a boost to the mathematical culture in the community and laid the foundations for the organization of a new type of mathematical journal: the new *Uspekhi* that began to come out regularly immediately after the war.

The main goal of the new publication was still stated as it had been in the preface "From the editors" of the first issue of 1936, "to enable a wide circle of Soviet mathematicians to follow the achievements of modern mathematics and thereby enhance their mathematical qualifications". The new journal (which from 1952 became a joint venture of the Society and the Academy of Sciences of the USSR) became the main Soviet mathematical periodical publication; coming out 6 times a year, it publishes review articles, informational materials on mathematical life in Russia (in particular, on the meetings of the Moscow and Leningrad Societites) and overseas [23]. In the journal there appears a "Communications of the Moscow Mathematical Society"section, which is currently intended for the rapid publication of results of the highest scientific level.

The Society assumed the main role in the creation of fundamental works on the development of mathematics in the USSR. The first such was the extra number of volume 35 of the Society's journal *Matematicheskiĭ sbornik* for 1928, devoted to the achievements of mathematics in the USSR during the first 10 years of Soviet rule. Khinchin wrote on achievements in number theory, Lavrent'ev and Privalov on the theory of functions of a complex variable, Men'shov and Lavrent'ev on the theory of functions of a real variable, Yu. A. Rozhanskaya and Stepanov on topology. The Society subsequently issued the widely known fundamental publications *Mathematics in the USSR after 15 years*, *Mathematics in the USSR after 30 years*, the two-volume *Mathematics in the USSR after 40 years*, and also the two books of the second volume of *Mathematics in the USSR 1958–1967*. The Society organized congresses, conferences and seminars, and awarded special prizes for young scientists. Amongst the winners of the Society prizes, we see the

blossom of the mathematical thought of the country. The first winners of prizes of the Moscow Mathematical Society in 1935 were I. M. Gel'fand, M. V. Keldysh and P. K. Rashevskiĭ. This prize was awarded to S. A. Khristianovich and N. G. Chudakov in 1936, B. V. Gnedenko, V. V. Sokolovskiĭ, A. I. Uzkov and S. N. Chernikov in 1939, V. Ya. Kozlov, L. A. Mel'tser, G. P. Tolstov and D. O. Shklyarskiĭ in 1940, N. Ya. Vilenkin and N. A. Lednëv in 1945, G. M. Adel'son-Vel'skiĭ with A. S. Kronrod and I. A. Vaĭnshteĭn in 1946, M. I. Graev and A. D. Myshkis in 1947, A. S. Kronrod and S. N. Merelyan in 1948, M. I. Vishik and I. R. Shafarevich in 1949, E. B. Dynkin and S. B. Stechkin in 1950, E. M. Landis and K. A. Sitnikov in 1951, Yu. V. Prokhorov and I. I. Lyatetskiĭ-Shapiro in 1952, L. D. Kudryavtsev in 1953, M. M. Postnikov, L. A. Skornyakov and P. L. Ul'yanov in 1954, R. L. Dobrushin and F. I. Karpelevich in 1955, S. I. Adyan and A. G. Vitushkin in 1956, V. I. Arnol'd and F. A. Berezin in 1957, A. A. Muchnik and A. S. Shvarts in 1958, V. A. Kondrat'ev and O. B. Lyapunov in 1959, A. G. Kostyuchenko with B. S. Mityagin and Ya. G. Sinaĭ in 1960, O. V. Besov in 1961, A. S. Dynin, A. L. Onishchik, L. A. Sakhnovich, E. G. Sklyarenko in 1962, A. D. Venttsel', E. B. Vinberg with S. G. Gindikin and Yu. I. Manin in 1963, E. S. Golod, S. P. Novikov, E. P. Dolzhenko in 1964, D. V. Anosov and A. A. Kirillov in 1965, B. R. Vaĭnberg with V. V. Grushin and Yu. V. Egorov, B. G. Moĭshezon and A. M. Olevskiĭ in 1966, A. B. Katok with V. I. Oseledets and A. M. Stëpin and V. P. Palamodov in 1967, D. A. Kazhdan, G. A. Margulis and M. S. Mel'nikov in 1968, A. Yu. Ol'shanskiĭ and G. M. Khenkin in 1969, V. M. Bukhshtaber with A. S. Mishchenko, M. L. Gromov and G. V. Chudnovskiĭ in 1970, S. Yu. Arakelov with A. N. Parshin, Yu. V. Matiyasevich and A. T. Fomenko in 1971, Yu. P. Razmyslov and A. L. Toom in 1972, A. N. Varchenko and D. S. Sil'vestrov in 1973, L. N. Vasershteĭn with A. A. Suslin and N. N. Nekhoroshev in 1974, I. N. Bernshteĭn and A. M. Gabrielov in 1975, B. A. Dubrovich, A. R. Its, I. M. Krichever and E. V. Shchepin in 1976, V. M. Kharlamov in 1977, B. S. Kashin and V. V. Nikulin in 1978, R. I. Grigorchuk and V. G. Drinfel'd in 1979, G. V. Belyĭ and V. Kh. Salikhov in 1980, A. S. Merkur'ev in 1981, M. V. Safonov and N. S. Nadirashvili in 1982, A. A. Beĭlinson and S. M. Voronin in 1983, P. I. Katsylo in 1984, V. A. Vasil'ev and A. N. Dranishnikov in 1985.

The tradition of awarding prizes to young mathematicians for outstanding mathematical results continues today. The level of the results of our young mathematicians continues to meet the highest world standards. Thus, in 2014 a prize was awarded to A. Yu. Buryak for a cycle of works "Topology of moduli spaces of curves and integrable hierarchies" and V. E. Gorin for a cycle of research "Asymptotic problems of combinatorics and representation theory", and in 2015 to L. A. Petrov on a cycle of works "Combinatorics of graphs of branches and probabilistic models". The prizes of the Moscow Mathematical Society have recognized the first successes of many subsequently outstanding mathematicians. Some of these winners were also awarded the Fields Medal: S. P. Novikov (1970), G. A. Margulis (1978), V. G. Drinfel'd (1990). M. L. Gromov and Ya. G. Sinaĭ won the Abel Prize in 2009 and 2014, respectively.

The Society has also had a great significance in the development of mathematical education, first of all in Soviet high schools. This theme had been a focus of the Society since its foundation. In the first ten volumes of *Matematicheskiĭ sbornik* there was a special section intended for school teachers and student youth, in which articles were published on elementary mathematics, history and philosophy of mathematics, and purely informative notes. (In this section, a Russian translation of M. Shal's *History of geometry* was published.) In February 1934, a section on elementary mathematics was created, soon renamed scientifico-pedagogical, and then the high-school section. During the war, this section did not operate, and reopened only in 1948 (under the guidance of

A. I. Markushevich). The main goal of the section was to increase the level of mathematics teaching in schools, to share teaching experience, and to establish a permanent connection between the teachers of secondary and high schools. Of particular note is the Society's initiative of the mid-1930s in the organization of school mathematics competitions, the first of which was held in the Autumn of 1935. The chairman of the organizing committee was the president of the Society, P. S. Aleksandrov. Thus began the subsequently powerful Olympiad movement in Russia. Many well-known mathematicians of the twentieth century began their careers as winners of these competitions.

Throughout its history, the Society has repeatedly discussed the problems associated with programmes and textbooks in mathematics for high schools. Thus, a stormy and extremely crowded meeting of the Society, held on 27 November 2001, was devoted to the proposed school reforms and the perspectives on mathematics education put forward by the Ministry of Education of the Russian Federation and caused a negative reaction in the mathematical community.

The role of a public organization made the activities of the Moscow Mathematical Society particularly important in the ideologized Soviet society.

It should be noted that all forms of social activity in the Soviet Union were under constant ideological control. Any significant document (for example, a characteristic of a person who wanted to go abroad for whatever reason — for an international scientific conference in Great Britain or to relax on the beaches of friendly Bulgaria) was to be signed by the so-called triangle, consisting of the head of the organization, the secretary of the Party organization (even if the would-be traveller was not a Party member) and the chairman of a trade union organization. (For instance, for a member of the Mechanics and Mathematics Faculty of Moscow State University these were the Dean, the secretary of the Party bureau and the chairman of the union of the faculty.) Scientific societies were outside this total control. Thus, the activities of the Moscow Mathematical Society were governed by its charter, and these activities were managed by its elected leadership, headed by the president. As a result, the rostrum provided at meetings of the Society placed mathematics in a difficult position with Soviet and Party authorities. For example, one of the most prominent dissidents of the 1960s and 1970s, A. S. Esenin-Vol'pin, could speak at the Society during these years on his ultra-intuitionist programme for the foundations of mathematics. Moreover, the Society was "allowed" at the beginning of the 1970s to elect as its president I. R. Shafarevich, who then engaged in active human rights work.

We note also the important fact that the president of the society has always been a great, for the most part even the greatest, mathematician of his time, which, of course, raised prestige and importance in the national mathematical community. The list of presidents, beginning in 1923, is as follows: 1923–1931 — D. F. Egorov; 1932–1964 — P. S. Aleksandrov (1896–1982); 1964–1966 and 1973–1985 — A. N. Kolmogorov (1903–1987); 1966–1970 — I. M. Gel'fand (1913–2009); 1970–1973 — I. R. Shafarevich; 1985–1996 — S. P. Novikov; 1996–2010 — V. I. Arnol'd (1937–2010). Since 2010, the Society has been headed by V. A. Vasil'ev. Note that not one of these outstanding scientists who led the Society during the Soviet era[13] was a member of the Communist Party — an amazing fact for the Soviet period, since one is unlikely to find many examples of associations for which no leaders during the Soviet period were members of the Party. Of course, not all of them were, like Egorov, staunch enemies of Soviet authority, but all had one thing in common — their commitment to mathematics: for all these people, their science was the main content of their lives, and everything that could directly or

[13]The forcibly "elected" president for a short period at the turn of 1930–1931, E. Kol'man, is a kind of "bad anecdote", serving not as a refutation, but as a confirmation of the rule.

indirectly hinder them in their mathematical occupations (and membership in the Party could interfere in all spheres of life, up to family; we remember the slogan: "First of all you are a member of the Party!") they ignored.

Founded as a circle of mathematicians supporting each other in scientific occupations, the Moscow Mathematical Society was transformed into an informal association, to a large degree coordinating and organizing activities not only in Moscow, but also in the national mathematical community. In the Soviet period, it took over the role of leading public organization, independent of Party and government organs to a certain extent. Manoeuvring between administrative organizations that did not always act in unison — the Department of Mathematics of the USSR Academy of Sciences and the Steklov Mathematical Institute on the one hand, the Ministry of Higher and Secondary Special Education of the USSR, the leadership of Moscow University and of its Mechanics and Mathematics Faculty on the other — the Moscow Mathematical Society successfully overcame the barriers encountered on its way, while maintaining a high academic reputation and authority in the national mathematical community.

Speaking of the Society in the life of national mathematics in the 1950s–1970s, it is impossible not to mention the prominent role of the rector of Moscow University, Ivan Georgievich Petrovskiĭ, who valued the Society highly and helped it by all available means in the very difficult political situation of those years.

It was during the difficult sixties that Moscow mathematics had its golden heyday — a time in which, along with the major mathematicians who had become famous for their achievements even before the war, the rising stars of the twentieth century took their first steps — D. V. Anosov, V. I. Arnol'd, Yu. I. Manin, S. P. Novikov, Ya. G. Sinaĭ. During these years, the Society had its 100th anniversary [24, p. 236]. On 20 October 1964, a solemn meeting was held, at which the then-president Aleksandrov [25] and A. G. Kurosh [26] spoke about the activities of the Society during the last third of a century, as did its oldest members D. E. Men'shov [27] and L. A. Lyusternik [28]. Then commemorative readings were held, demonstrating the breadth of the range of mathematical creativity of the Society's members. Here also were the Muscovites N. N. Bogolyubov [29], M. I. Vishik, Kolmogorov, the quite young S. P. Novikov [30] and I. I. Pyatetskiĭ-Shapiro, as well as M. G. Kreĭn from Odessa, and A. V. Skorokhod [31] from Kiev.

In order to demonstrate the richness of mathematical life and the role of the Moscow Mathematical Society, we give the names of speakers and the topics of the lectures that they delivered at meetings of the Society during the same season: from autumn 1969 to spring 1970. (The information is taken from the materials of the then-secretary of the Society — the remarkable mathematician Vladimir Mikhaĭlovich Alekseev. The figures quoted in parentheses are the number of members of the Society present at the lecture, and the number of mathematicians not then participating — these figures largely determined the pulse of the mathematical life of the time.)

14.10.69. S. P. Novikov "Algebraic K-theory from the point of view of Hamiltonian formalism" $(59 + 137 = 196)$.

21.10.69. E. Hewitt (USA) "Some lacunae in the theory of lacunary series" $(23+13 = 36)$.

28.10.69. Meeting devoted to the winners of the Society prizes for 1968 $(26 + 79 = 105)$.

D. A. Kazhdan "On the connection between the cohomology of semisimple Lie groups and the cohomology of its discrete subgroups".

G. A. Margulis "Isometry of manifolds of constant negative curvature with given fundamental group".

M. S. Mel'nikov "Metric properties of analytic A-capacity and applications of analytic functions with Hölder rational function A-condition".

18.11.69. I. M. Gel'fand, D. B. Fuks "Cohomology of infinite-dimensional Lie algebras" $(43 + 115 = 158)$.

25.11.69. S. I. Adyan "Identical relations in groups" $(31 + 41 = 72)$.

02.12.69. G. N. Tyurina "Universal deformations of isolated singularities of complex spaces" $(25 + 57 = 82)$.

25.01.70. E. Kolchin (USA) "Galois theory of differential equations" $(36 + 58 = 94)$.

17.02.70. V. A. Belinskiĭ, E. M. Lifshits, I. M. Khalatnikov "On features of cohomological solutions of equations of gravitation" $(32 + 59 = 91)$.

24.02.70. A. N. Kolmogorov "Statistics of ocean hydrodynamics" $(32 + 107 = 139)$.

03.03.70. V. A. Rokhlin "Two-dimensional homology and two-dimensional submanifolds of four-dimensional manifolds" $(35 + 87 = 122)$.

10.03.70. A. V. Arkhangel'skiĭ "On the power of bicompacta" $(28 + 36 = 64)$.

17.03.70. Yu. K. Belyaev "Wavelets of random fields".

V. I. Arnol'd "On some algebraic invariants of algebraic functions" $(24 + 46 = 70)$.

14.04.70. Yu. V. Matiyasevich "Diophantine denumerable sets" $(31 + 150 = 181)$.

What a brilliant set of speakers! What a variety of topics: algebraic geometry, algebraic and general topology, cosmology and hydrodynamics, mathematical logic (represented by solutions of Burnside's (Adyan) and Hilbert's problems (Matiyasevich)), probability, algebra, analysis, function theory.

Kolmogorov played an active part in the work of the Society throughout his creative life. His first appearance was in the year of his first publication (1923), and his last in 1985, when he was already seriously ill. In all he spoke at meetings of the Society about his own results and reviews around 100 times! In the 1970s, his authority prevented the dissolution of the Society, which proved to be beyond the control of Party structures during the intensification of the struggle against dissent.

The Moscow Mathematical Society played a role in the history of the Soviet mathematical school, from its formation in the 1930s, to its peak in the 1960s and 1970s. Its real triumph was the International Congress of Mathematicians, held in August 1966 at the Lomonosov Moscow State University. Out of 84 invited speakers (17 one-hour, 67 half-hour lectures) 31 were Soviet (5 one-hour, 26 half-hour). The Moscow Mathematical Society was one of the main organizers of the congress, at which a central position was occupied by the lectures of members of the Society, both mathematicians of the older generation — I. M. Vinogradov, N. V. Efimov, S. L. Sobolev, A. N. Tikhonov — and the then quite young D. V. Anosov, V. I. Arnol'd, A. A. Kirillov, Yu. I. Manin, and S. P. Novikov.

§ 7. The Society in the past decade of its history

The Society continued to execute its high mission during the difficult years of perestroika and the subsequent complicated period of our history. The beginning of the 1990s was particularly difficult, when S. P. Novikov served as president. On the strength of his authority in the Academy of Sciences and Moscow University, he was able to secure for the Society the necessary legal status, which in those years, when many scientific societies lost their official status, was not easy. Together with the leading mathematicians of Europe (M. Atiyah, F. Hirzebruch) he became a founder of the European Mathematical Society and did much for its development, in particular strengthening its ties with the Moscow Mathematical Society. For several years, the Moscow Society was represented in the European leadership by V. M. Bukhshtaber.

Novikov took the initiative of giving international status to the title "Honorary member of the Moscow Mathematical Society"[14]. Along with the greatest domestic mathematicians (some of whom were at this time already working overseas) A. D. Aleksandrov, E. B. Dynkin, M. L. Gromov, V. G. Kats, Yu. S. Osipov, A. V. Pogorelov, I. I. Pyatetskiĭ-Shapiro, and Yu. G. Reshetnyak, this title was awarded to M. Atiyah, J. S. Birman, R. Bott, H. Cartan, P. Deligne, F. Hirzebruch, K. Ito, P. Lax, J. Leray, R. D. Macpherson, J. Milnor, K. S. Moravets, L. Nirenberg, L. Schwartz, I. M. Singer, S. Smale, R. Tom, and A. Weil.

After the sudden death in 2010 of Arnol'd, the then-president of the Society, Novikov took the initiative and proposed for the Society's leadership the candidacy of V. A. Vasil'ev, who was elected president. Novikov himself was elected honorary president. On their shoulders, as well as on those of the rest of the leadership, there fell the never-easy duty of steering the ship of the Society along the current restless ocean of modern life.

The traditions established by the founders of the Moscow Mathematical Society, reinforced and developed by the outstanding representatives of the next generation, became a solid foundation for the continuation of its successful scientific and organizational activities. At the base of these traditions lie high academic standards, the essence of which was expressed at the centennial of the Society by its then-president Pavel Sergeevich Aleksandrov [25, p. 9]: "... the Moscow Mathematical Society has always cultivated ... a multi-faceted development of mathematics, without trying to squeeze it into any existing framework and system of evaluation. For decades, the Moscow Mathematical Society has been the place in which there grew and lived mathematical discoveries, quests, excitement, all the creative emotions of Moscow mathematicians of several generations. The Moscow Mathematical Society has been not only the place where individual mathematical results were registered, where popular lectures on mathematics were delivered. The Moscow Mathematical Society has been a school of mathematical aesthetics, mathematical taste, very discerning, and a school of mathematical ethics, scientific ethics, also very demanding ...".

In the difficult periods experienced by Russian mathematics, the Society did not hesitate to take upon itself the role of national society. Today the Russian mathematician is going through just such a period. And we want to express hope for the success of the future activities of the Society in the implementation of its voluntarily adopted high mission: "to promote the development of the mathematical sciences in Russia". It saw its goal as being that of the Moscow mathematicians who gathered one hundred and fifty years ago in the apartment of their old teacher at the Prechistenskie Gate. Their modern Moscow colleagues can set more ambitious goals: to contribute to the development of the mathematical sciences in Europe and the world.

P. S. It seems appropriate to conclude our review by informing readers that on 27–29 November 2015 a meeting of the Executive Committee of the European Mathematical Society was held at the Steklov Mathematical Institute of the Russian Academy of Sciences, dedicated to the anniversary of the Moscow Mathematical Society. A report on the history of the Society and its current situation was made by the president of the Society V. A. Vasil'ev.

[14]This title had existed for a long time. It was awarded to N. E. Zhukovskiĭ, O. Yu. Schmidt, S. A. Chaplygin, N. M. Günter, A. N. Krylov, V. F. Kagan, V. V. Stepanov, and in later years, P. S. Aleksandrov, S. N. Bernshteĭn, I. M. Vinogradov, M. V. Keldysh, A. N. Kolmogorov, A. G. Kurosh, L. A. Lyusternik, D. E. Men'shov, I. G. Petrovskiĭ, V. I. Smirnov, N. N. Bogolyubov, I. M. Gel'fand, P. Ya. Kochina, M. G. Kreĭn, B. Ya. Levin, S. M. Nikolskiĭ, S. L. Sobolev, and D. K. Faddeev.

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