

Research Question: How were the careers of Kazakh mathematicians shaped by the political purges and ideological constraints of the Stalinist period?

Introduction

The Stalinist period is one of the most influential periods in Soviet and Central Asian history. The Stalinist period was preceded by the collapse of the Russian Empire and the Bolshevik consolidation of power across a vast territory, transforming the political, economic, social and national life of the Soviet population. Anti-religious propaganda, nation-building programs, through ideological campaigns, transformed the realm of these territories up to current times.

The history of mathematics of Soviet Kazakhstan provides an insight into the overall dynamics of the educational field during the period of totalitarian rule. Although mathematics as a science was viewed as being apolitical science, its institutional history of the Stalinist era in Kazakhstan was closely intertwined with ideological control, political oppression, and changing priorities of the state. The given project has the following research question: How were the careers of Kazakh mathematicians shaped by the political purges and ideological constraints of the Stalinist period?

The answer to this question reveals not only the fate of individual Kazakh mathematicians of the given period but also shows the structural forces that shaped the emergence of scientific institutions in a colonial and authoritarian context as the Soviet Union tried to consolidate the power in regions that were already under the control of the Soviet State by the process of “russification”, which was created to promote Russian culture and language as well as their ideology to colonize other lands and use them and their resources to develop the Soviet state and transform it to the “utopia” which was promised to the Soviet population.

In terms of the colonial context of the Soviet Union, even though many scholars like Benjamin Loring claim that the Soviet Union had colonial power and was colonizing a huge territory¹, others like Francine Hirsch still state that the Soviet Union cannot be claimed as a colonizer and their colonialism was nothing more than accident². She states that the Soviet Union acted and functioned as an “empire of nations” and paradoxically promoted national cultures while establishing central control. The period of World War II is one piece of evidence that the Soviet Union was colonial because of the deportation of the Crimean Tatars from Crimea to Central Asia, according to J. Otto Pohl, was not fully marked as a colonial event, but more like an event which pointed towards settler colonialism³. This event was connected to settler colonialism in the socialist state. According to Patrick Wolfe, in his work named “Settler Colonialism and the Elimination of the Native”, he mentioned that the main motivation of the colonial state’s removal of native peoples is to get an access to the new territories and has nothing to do with the nation, race, religion, etc.⁴ So, even though we cannot fully claim that the Soviet Union was a colonial state, they had some identification which proves that they had colonial power and tried to implement this power to promote their ideologies to other nations, countries and states.

¹ Zachary, A.H. “Internal Colonialism: Questioning the Soviet Union as a Settler Colonial State Through the Deportation of the Crimean Tatars/Uranium Fever: Willful Ignorance in Service of Utopia”. Loring, B. “Colonizers with Party Cards: Soviet Internal Colonialism in Central Asia, 1917-1939”, p.13

² Hirsch, Francine. *Empire of Nations: Ethnographic Knowledge and the Making of the Soviet Union*. Ithaca: Cornell University Press, 2005.

³ Zachary, A.H. “Internal Colonialism: Questioning the Soviet Union as a Settler Colonial State Through the Deportation of the Crimean Tatars/Uranium Fever: Willful Ignorance in Service of Utopia”, p.1-2

⁴ Zachary, A.H. “Internal Colonialism: Questioning the Soviet Union as a Settler Colonial State Through the Deportation of the Crimean Tatars/Uranium Fever: Willful Ignorance in Service of Utopia”. Patrick Wolfe, “Settler Colonialism and the Elimination of the Native,” *Journal of Genocide Research* 8, no. 4 (December 2006): 387-388.

The main argument of the given paper is that Stalinist repression simultaneously destroyed Kazakhstan's first generation of nationally oriented mathematicians, who connected with early indigenous intellectual projects, and constructed the foundations for a new cohort, who were specifically trained according to State ideologies and who operated under significant political and ideological limitations and constraints, which required alignment of their research and projects with state objectives. The Stalinist 1930s produced a paradox, which created the regime that enabled rapid scientific modernization that also targeted many of the intellectuals who were needed to carry it out. The Soviet State began to pay a huge attention towards Kazakh intellectuals, which in our case are mathematicians, who played a huge role in the development of the Soviet transformation processes. In many cases, the Soviet state needed STEM related people, because engineers and mathematicians had a spectrum of skills and knowledge, which could be implemented to the requirements of the Soviet state. This tension between developmental ambition of the State and political suspicion shaped the institutional landscape of mathematics in Soviet Kazakhstan for decades.

The historiographical context of this study draws on two intersecting scholarly conversations. The first concerns the broader relationship between science and political power in the Soviet Union. Scholars like Loren Graham have demonstrated that Soviet science was never truly insulated from ideological pressures, even if fields considered technically neutral.⁵ In his foundational work *Science in Russia and the Soviet Union*, Graham describes how the Soviet state used scientific institutions as instruments of ideological legitimation, rewarding conformity and penalizing independent inquiry. This framework is directly applicable to the Kazakh case,

⁵ Hughes, Thomas Parke. "Lessons From Soviet Science and Technology." *Technology and Culture* 41, no. 2 (2000):350.

where mathematical education and research were embedded within an ideological apparatus that prioritized collective utility over individual scholarly autonomy.

The second historiographical conversation concerns the colonial and postcolonial dimensions of Soviet rule in Central Asia. Scholars like Adeeb Khalid in his work “Making Uzbekistan”, which was published in 2015, have examined how Soviet modernization projects simultaneously empowered and constrained non-Russian intellectual communities. Khalid’s argument that Soviet cultural policy created a paradox of revolutionary modernity, which offers inclusion into a modernizing project while demanding ideological submission, and this paradox resonates strongly with the Kazakh experience documented in this paper.⁶ The mathematicians examined here navigated precisely this paradox: embracing Soviet scientific institutions while negotiating, and often suffering under the ideological demands attached to them.

The significance of this research is about its contribution to two fields: the history of Soviet science and the emerging scholarship on Kazakhstan’s intellectual past. While political repression of Kazakh elites has been well documented, the specific trajectories of mathematicians remain underexplored.⁷ Their experience sheds light on how seemingly “ideologically neutral” sciences like mathematics were nevertheless embedded in state power, and how technical knowledge became a site of negotiation between local aspirations and centralizing Soviet policies.

Geographically, the study focuses on major intellectual centers of the Kazakh SSR, which includes Almaty, Karaganda and Shymkent, where universities, pedagogical institutes and later

⁶ Khalid, Adeeb. *Making Uzbekistan: Nation, Empire, and Revolution in the Early USSR*. Cornell University Press, 2015.

⁷ Ramazanov, R. T. "Repressed Kazakh Intelligentsia." *Qazaq Journal of Young Scientist* 2 (2021): 117–125. & Sarsenbayev, B. "Political Repressions against Kyrgyz and Kazakh Elite in the 1930s and Their Implications." *Opción* 36, Special no. 26 (2020): 1555–1571.

the Academy of Sciences developed. In terms of chronological frame, it considers the early 1920s, when the Kazakh ASSR was established and the first national cadres emerged, World War II period, and also contains the post-Stalin rehabilitation of the 1950s-1960s, when many repressed scholars were formally justified and scientific institutions expanded. The Stalinist 1930s and early 1940s serves as a narrative core, as these periods marked the most intense intersection of ideological control and institutional development.

Methodologically, this study is based on a mixed source base. Primary documents include archival documents from the Stalinist period, post-Stalin period, which has data about the professional life of specific Kazakh intellectuals, the overall situation in the intellectual field of the Soviet state, how Soviet regime influenced the career path of young Kazakh mathematicians and what opportunities do they have under the political and ideological constraints which were created by the Soviet State. Secondary sources include scholarship on Soviet censorship⁸, studies of repression in Kazakhstan⁹, and historiographical work on Soviet education¹⁰. Together, these sources illustrate how individual lives intersected with broader structures of repression and ideological control.

In terms of structure of the given paper, Section II provides the historical background for the research, mentioning the Soviet modernization of science in Soviet Kazakhstan, the formation of national intellectual elites, and the ideological conditions that precede the Terror. Section III uses personal case studies of Kazakh mathematicians such as Alimkhan Yermekov,

⁸ Aubakirova, K., M. Zhanibek, S. Aituganova, A. Altay, and E. Rakhmetullin. "Censorship of the Soviet Union in Kazakhstan." *Scientific Herald of Uzhhorod University. Series Physics* 56 (2024): 545–552.

⁹ Tanatarova, Zhamiga. "Repressions of 1937–1938 in Kazakhstan and Their Consequences." *International Journal of Humanities Social Sciences and Education* 2, no. 1 (2015): 93–104.

¹⁰ Zhumashev, R. M., A. Zh. Myrzakhmetova, and D. Ote. "Studying the History of Education in the Works of Soviet Researchers in Kazakhstan." *Bulletin of the Karaganda University — History. Philosophy Series* 100, no. 4 (2020): 47–54.

Ibadlla Akbergenov, Orymbek Zhautukov and Kudaibergenov to analyze the mechanisms of Stalinist repression and the establishment of mathematical institutions. Section IV turns to the post-Stalin rehabilitation era, examining how the 1950-1960s rebuilt scientific structures while selectively remembering the individuals who were repressed. Finally, the conclusion reflects on the broader implications of the Kazakh experience for understanding the relationship between knowledge and power in authoritarian settings.

Section II. Historical Background: Stalinism and Kazakhstan's Scientific Modernization

Understanding the fate of Kazakh mathematicians under the Stalinist regime requires examining their experience within the broader political, cultural and institutional transformations of the early Soviet period. The development of scientific institutions in Kazakhstan did not start with Stalin but with the Bolshevik project of socialist modernization, which sought to transform the region from a “backward periphery” into a modern, industrialized republic as “backwardness” remained as a prominent element of local people and made transformation challenging for Soviet state¹¹. For example, in order to celebrate the twentieth anniversary of the October Socialist Revolution of 1971, there was a paper published named “20 Years of Soviet Mathematics”, where all achievements in different areas like the growth of Soviet science, the growth of Soviet culture and overall growth of the Soviet Union was mentioned.¹² It was mentioned that even in the first years of the existence of the Soviet state, they opened new higher education institutions, which gave an opportunity and cooperation for Soviet science to develop and grow.¹³ Also, the creation of new technology served as a powerful tool for the development

¹¹ Kassymbekova, Botakoz. 2017. “Understanding Stalinism in, from and of Central Asia: Beyond Failure, Peripherality and Otherness.” *Central Asian Survey* 36 (1), p.1

¹² "Soviet Mathematics for 20 Years." *Uspekhi Matematicheskikh Nauk* 4 (1938): 3–13. Summarised in MacTutor History of Mathematics Archive. Accessed September 26, 2025.

¹³ "Soviet Mathematics for 20 Years." *Uspekhi Matematicheskikh Nauk* 4 (1938): 3–13. Summarised in MacTutor History of Mathematics Archive. Accessed September 26, 2025.

of the exact sciences like mathematics.¹⁴ A significant number of the young people who graduated from the mathematical departments began their scientific work, which then began to circulate in hundreds and thousands of copies, figures that at that time were unheard of in any other country.¹⁵ Yet this project coexisted with profound anxieties about national elites, intellectual autonomy and ideological deviation. These contradictions set the stage for both the rise and destruction of early Kazakh scientific cadres.

The establishment of the Kazakh Autonomous Socialist Soviet Republic (Kazakh ASSR) in 1920 initiated a new phase of administrative and cultural consolidation. Soviet authorities invested heavily in literacy campaigns, the establishment of schools and the training of local specialists. The *korenizatsiia* policy of the 1920s sought to promote national cadres into administrative and educational positions, creating opportunities for the first generation of Kazakh intellectuals, including mathematicians, to get advanced training. Figures such as Alimkhan Yermekov took advantage of the opportunities afforded by *korenizatsiia* and the expansion of the educational system. In 1921, he opened a two-stage school and pedagogical technical school in Karakalinsk, from which future academician and known mathematician Orymbek Zhautykov graduated¹⁶. Moreover, he published manuals of mathematical terminology and textbooks for schools in Kazakh language when he was a dean of General technical Faculty in Almaty mining-metallurgical institute¹⁷. His mathematical works in the native Kazakh language and efforts to develop local terminology for educational purposes reflected a broader cultural movement to articulate scientific knowledge through national language as Bolsheviks adopted a

¹⁴ "Soviet Mathematics for 20 Years." *Uspekhi Matematicheskikh Nauk* 4 (1938): 3–13. Summarised in MacTutor History of Mathematics Archive. Accessed September 26, 2025.

¹⁵ "Soviet Mathematics for 20 Years." *Uspekhi Matematicheskikh Nauk* 4 (1938): 3–13. Summarised in MacTutor History of Mathematics Archive. Accessed September 26, 2025.

¹⁶ Karaganda Technical University. Biography of Alimkhan Yermekov.

¹⁷ Karaganda Technical University. Biography of Alimkhan Yermekov.

proactive strategy which allowed non-Russian nationalities' promotion of nation-building, including their traditions and culture.¹⁸

However, even during the 1920s, tensions between promoting national development and enforcing ideological conformity were already emerging. According to Zhumashev, Myrzakhmetova and Ote, Soviet educational research in Kazakhstan emphasized Marxist-Leninist doctrine and rejected pre-revolutionary intellectual traditions as “bourgeois”.¹⁹ Particularly, religious intellectual schools like madrasah-based learning, which were related to Islamic scholarship, Turkic nationalist thought, which were connected with Alash movement and Russian liberal academic influences were labelled as "bourgeois". These traditions which were mentioned were rejected because they were representation of religion, nationalist movements and class hierarchies, all of which were contradicting the goals of the Soviet state. This ideological boundary-setting foreshadowed later repression.

By the late 1920s, the Stalinist policy aimed toward fast industrialization, which as a result, transformed the role of education and scientific knowledge. Kazakhstan, which is rich in minerals and had a strategic location, became a key object for Soviet Economic expansion. New technical institutes, pedagogical universities and scientific stations, such as the Kazakh Mining and Metallurgical Institution and Kazakh State University, were created to support industrial planning, mining and engineering. These institutions were directly connected with the goals of Five-year Plan(1928-1932), which prioritized heavy industry and resource extraction.

¹⁸Terry Martin, *The Affirmative Action Empire: Nations and Nationalism in the Soviet Union, 1923–1939* (Ithaca, NY: Cornell University Press, 2001)

¹⁹ Zhumashev, R. M., A. Zh. Myrzakhmetova, and D. Ote. “Studying the History of Education in the Works of Soviet Researchers in Kazakhstan.” *Bulletin of the Karaganda University – History. Philosophy Series* 100, no. 4 (2020): 47–54. Accessed September 27, 2025.

Mathematics acquired new importance as a practical discipline essential for production and technological progress.²⁰

The transformation of mathematics into an instrument of industrialization had direct consequences for how mathematical knowledge was organized and transmitted. Prior to the Soviet period, mathematical education in the region had been fragmentary, confined largely to traditional Islamic schools (maktabas and madrasahs) that incorporated arithmetic and geometry into broader religious curricula, and to the limited network of Russian-language gymnasia established during the tsarist period.²¹ The Bolshevik modernization project swept away this pluralistic educational landscape and replaced it with a centralized system in which mathematics served explicitly defined state functions²². As Sheila Fitzpatrick notes in her work named “Education and Social Mobility in the Soviet Union, 1921-1934”, Soviet educational reformers consistently frame technical knowledge as a tool of class transformation and national development, embedding it within a broader narrative of socialist progress.²³ This reframing was simultaneously enabling, it created new institutional spaces for Kazakh students who would previously have had no access to advanced mathematical training and constraint, as it subordinated the intellectual development of mathematics to the immediate productive needs of the state.

²⁰G. G. Lorentz, "Mathematics and Politics in the Soviet Union from 1928 to 1953," *Journal of Approximation Theory* 116, no. 2 (2002): p.197

²¹ Elena Dmitrieva, "The System of Islamic Education in Russia (20th – Early 21st Centuries)," *Russia and the Moslem World*, (2018): p.18

²² Irene Blumenthal and Charles Benson, *Educational Reform in the Soviet Union: Implications for Developing Countries*, World Bank Staff Working Paper No. 288 (Washington, D.C.: World Bank, May 1978), p.1

²³ Fitzpatrick, Sheila. *Education and Social Mobility in the Soviet Union 1921–1934*. of *Cambridge Russian, Soviet and Post-Soviet Studies*. Cambridge: Cambridge University Press, 1979.

To trace the line of mathematical education in Soviet Kazakhstan, it would be necessary to analyze the institutional landscape of the mentioned region that was in place at the end of the 1930s. The last, yet the most significant was Kazakh State University (now Al-Farabi Kazakh National University) established in Almaty in 1934 that comprised the Faculty of Physics and Mathematics and became the central institution of producing mathematicians and physicists. In 1934 the Kazakh Mining and Metallurgical Institute (since 1956, reorganized into Kazakh Polytechnic Institute (since 2006) majoring in technical and applied sciences) featured a Department of Higher Mathematics to supply the students of engineering. The Kazakh Pedagogical Institute based in Almaty (since the early 1930s) instructed schoolteachers in the natural sciences, mathematics and assumed a forefront role in the manufacture of the cadres to staff secondary schools throughout the republic. The Karaganda mining Institute was operating in other areas, not near Almaty, but in Karaganda, where coal mining was the need of the technically educated workers. Regional pedagogical institutes existed in such cities as Shymkent, Semipalatinsk, which also contributed to the teaching of mathematics on secondary and vocational level.

These institutions did not emerge as individual entities. They were designed in tight collaboration with the Soviet priorities of planning - the First and Second Five-Year Plans, which required high programs in people to engineer, survey, and technician. It is on these instrumental objectives that the departments of mathematics were developed. But they, too, gave physical facilities, libraries, lecture rooms and faculty rooms, in which mathematical information could be stored, and passed, and to some degree, nurtured. That such institutions existed meant that, though the arrest or silencing of individual mathematicians took place, the institutional structure of mathematics education did not disappear, though it was subjected to strict ideological control.

Yet the Sovietization of science meant more than institutional growth. It involved restructuring knowledge to fit a Marxist-Leninist worldview and ensuring that not only scientists, but also teachers in primary and secondary schools embraced ideological orthodoxy. The 1932 Party Resolution “On Curricula and Regime in Primary and Secondary Schools” was published on the 25th of August in 1932 by the Central Committee of the CPSU. The most important reason to publish the given resolution is shortcoming of the curricula, unsatisfactory methods of teaching and weak methodological guidance from the People’s Commissariat for Education and their local bodies, weak discipline in school and in some cases, the total lack of discipline and order.²⁴ The resolution formalized ideological control over teaching, requiring that all subjects, including mathematics, serve the goals of socialist construction: “Take into account the need to use the material of socialist construction in educational activities(exercises in Russian language, mathematics, social science, etc., ...).”²⁵ Teachers and scholars were expected to begin lessons with ideological statements and avoid "idealistic” approaches. As Aubakirova showed, censorship mechanisms in Kazakhstan scrutinized academic publications, teaching materials and even personal correspondence.²⁶

Thus, while institutional opportunities expanded, intellectual autonomy narrowed. Mathematicians now operated in a system where professional advancement hinged not solely on expertise, but also on political loyalty.

²⁴ Communist Party of the Soviet Union (Bolsheviks). "On Curricula and Regime in Primary and Secondary Schools." Resolution of the Central Committee, August 25, 1932. Marxists Internet Archive. Accessed September 16, 2025.

²⁵ Communist Party of the Soviet Union (Bolsheviks). "On Curricula and Regime in Primary and Secondary Schools." Resolution of the Central Committee, August 25, 1932. Marxists Internet Archive. Accessed September 16, 2025.

²⁶ Aubakirova, K., M. Zhanibek, S. Aituganova, A. Altay, and E. Rakhmetullin. "Censorship of the Soviet Union in Kazakhstan." *Scientific Herald of Uzhhorod University. Series Physics* 56 (2024): 545–552.

Scientific modernization in Kazakhstan unfolded against the backdrop of earlier political and cultural movements. Many of the republics' first educated elites had ties to the Alash-Orda movement, a national autonomist project active before 1920. Although many Alash figures initially cooperated with the Bolsheviks, their intellectual independence and national orientation made them highly suspect by the early 1930s.²⁷ For example, Alimkhan Yermekov, who was one of the first educated Kazakh mathematicians, was also included in the membership of Alash Orda movement when Alikhan Bokeikhanov was elected as the head of the given nationalist project in 1917.²⁸ During his time in Alash Orda, even though Alimkhan Yermekov worked for the freedom and independence of his nation, he and many other representatives of the given national movement were repressed and Alash Orda was labelled as counter-revolutionary.²⁹ As a result, many intellectuals like Yermekov, were repressed, and those who survived these political purges, had huge problems with returning to their academic careers and continuing working on their research.

The Stalinist regime increasingly demonised national elites as potential "enemies of the people" (Враг народа) who could promote alternative forms of authority. The very individuals responsible for building national culture and early scientific institutions became targets of surveillance of political pressure.

This dynamic had profound consequences for mathematicians. Many of them belonged to this early educated stratum, having received training in pre-revolutionary institutions or having been active in national cultural projects. Their social profile alone marked them as suspicious

²⁷ Ramazanov, R. T. "Repressed Kazakh Intelligentsia." *Qazaq Journal of Young Scientist* 2 (2021): 117–125. & Sarsenbayev, B. "Political Repressions against Kyrgyz and Kazakh Elite in the 1930s and Their Implications." *Opción* 36, Special no. 26 (2020): 1555–1571.

²⁸ Biography of Alimkhan Yermekov

²⁹ Biography of Alimkhan Yermekov

and could label them as potential “enemies of the people” and could single-handedly destroy their life, career and all their achievements and deeds.

The international context of the 1930s further intensified these pressures. The Soviet leadership’s anxiety about foreign infiltration and internal enemies was not simply paranoia but was shaped by geopolitical realities. The rise of fascism in Europe, military tensions with Japan on the eastern border, and the broader instability of the interwar period. According to historian Robert Conquest in “The Great Terror: A Reassessment”³⁰, the NKVD’s operational orders specifically targeted categories of people with foreign educational ties or connections to pre-revolutionary organisations- criteria that disproportionately captured the first generation of educated Kazakhs, who had often received training in Russian imperial universities or had participated in pan-Turkic intellectual networks. In this way, the purges were not random violence but a structured assault on precisely those social profiles that the first generation of Kazakh mathematicians embodied.

It is also worth noting the gender dimensions of early Kazakh scientific institutions, which remain largely absent from existing scholarship. The mathematical faculties established in the 1930s were almost entirely male environments, reflecting both traditional social norms and Soviet policies that, despite their official rhetoric of gender equality, were slow to integrate women into technical scientific positions in Central Asia. The few available institutional records from Kazakh State University’s Faculty of Physics and Mathematics show no women faculty members in mathematics in the 1930s³¹, suggesting that the repression of the first generation of

³⁰ Conquest, Robert. 1990. *The Great Terror: A Reassessment*. New York: Oxford University Press.

³¹ "Svedeniia o professorakh i dotsentakh Kazakhskogo gosudarstvennogo universiteta na 1936–1937 uchebnyi god" [Information on Professors and Associate Professors of Kazakh State University for the 1936–1937 Academic Year], December 20, 1936, TsGA RK (Central State Archive of the Republic of Kazakhstan)

Kazakh mathematicians was simultaneously a repression of a very particular gendered and ethnic subject: the educated Kazakh man with pre-Soviet intellectual ties.

Section III. The development of Modern Institutions in Soviet Kazakhstan and Stalinist repression

The appearance of the mathematical institutions in Soviet Kazakhstan during the Soviet period was tightly controlled and connected with political and ideological limitations of the 1930 and 1940s. The Stalinist regime raised and restricted the development of mathematicians. On one hand, the Soviet State believed that development of science is a vital part for industrialization, however, on the other hand, they were always suspicious towards intellectuals as they might have become “enemies of the people” and were targeting them as future criminals. As a result, the Soviet authority created the atmosphere of fear, censorship and ideological constraints, which also led to the shaping of the careers of individuals and the institutional trajectory of the development of mathematics in Soviet Kazakhstan.

This section examines how political purges, state policies and ideological control influenced the creation and development of mathematical institutions in Soviet Kazakhstan. It mainly focuses on the three main dimensions: the ideological and political control of scientific knowledge, the repression of individual scholars and the institutional adaptation that allowed mathematics to survive under the shadow of terror and fear. Through case studies of specific individuals like Orymbek Zhautykov, Alimkhan Yermekov, Ibadulla Akbergenov, the section argues that Stalinist repression simultaneously destroyed the first generation of Kazakh mathematicians and created the foundation for a new Soviet generation, defined by loyalty. In Stalin’s Soviet Union, even though mathematics was always considered as apolitical science, it was never politically neutral. Knowledge was a tool for controlling society and constructing

socialism. The Stalinist regime was planning to unify all branches of knowledge under one doctrine, which was stated that all science must serve the historical mission of the state. This approach even extended to discipline of mathematics, which for the regime, was viewed as an essential part for industrial progress but considered ideologically suspicious if detached from practical application.

The 1932 Party Resolution “On Curricula and Regime in Primary and Secondary Schools” institutionalized this control by prescribing centralized curricula and promoting Soviet ideologies.³² The decree effectively forced teachers in schools to the Party’s educational goals. As a result, “politically correct” interpretations replaced independent inquiry. As Zhumashev, Myrzakhmetova and Ote stated, Soviet researchers in Kazakhstan were forced to operate “under the atmosphere of strict ideological supervision”, where every academic statement or wrong action could be investigated and punished for crossing the Party’s ideas.³³

This ideological framework extended to mathematics. Courses were restructured to emphasize their role in production, engineering and economic planning. Theoretical mathematics, which were considered abstract, was often criticized as “useless idealism”. One of such people who criticized theoretical mathematics was a Czech-Soviet Marxist ideologue, Ernst Kolman, who was one of the leading individuals in the campaign to subordinate mathematics to dialectical materialism. His work “На Борьбу за материалистическую диалектику в математику”, which was published in 1931, directly attack theoretical mathematics as idealist and argued that unrestricted mathematization of the sciences invited “mathematical idealism”, which was seen as

³² Communist Party of the Soviet Union (Bolsheviks). “*On Curricula and Regime in Primary and Secondary Schools.*” Resolution of the Central Committee, August 25, 1932. In *Marxists Internet Archive*. Accessed September 16, 2025.

³³ Zhumashev, R. M., A. Zh. Myrzakhmetova, and D. Ote. “Studying the History of Education in the Works of Soviet Researchers in Kazakhstan.” *Bulletin of the Karaganda University – History. Philosophy Series* 100, no. 4 (2020): 47–54. Accessed September 27, 2025.

an enemy of materialistic dialectics.³⁴ Textbooks and syllabi were rewritten to align with the socialist ideas and many educators were forced to begin their lessons from ideological statements to promote them to children and students.

The contradiction at the heart of Stalinist science defined the experience of Kazakh mathematicians in the Soviet Union. The regime aimed to grow these experts for industrialization, and at the same time, suspected them as “enemies of the people” for their intellectual independence. As a result, it led to the unstable situation in the academic environment where conformity was often valued more than creativity and freedom.

The Great Terror (1937-1938) brought these tensions to its peak. Across the Soviet Union, NKVD arrested millions of people under the allegations of “counterrevolutionary activities”. In Soviet Kazakhstan, this campaign targeted mostly educators, intellectuals and scientists, particularly those with pre-revolutionary education or who were somehow connected to the Alash national movement.

The Memorial archives documents the arrests of teachers and professors in Almaty, including the members of mathematics and physics faculties.³⁵ The purges aimed to eliminate not only because of political reasons, but any alternative intellectual authority. They were replaced by younger, ideologically conformist and often less academically qualified., often less qualified than victims, but politically, more comfortable for the Party.

One of the most tragic victims of this process was Alimkhan Yermekov(1891-1970), widely regarded as the first Kazakh mathematician. A graduate of Tomsk Technological Institute, Yermekov combined mathematical training with a passion for national education. He was the

³⁴ Ernst Kolman, *Na bor'bu za materialisticheskuiu dialektiku v matematike* (Moscow, 1931), accessed via Internet Archive,

³⁵ Troika UNKVD for South Kazakhstan (Тройка УНКВД по ЮКО), protocol of 7 December 1937, published online at *Memorial* lists

author of the first mathematical books in Kazakh language, introducing the terms and methods that were accessible for local students.³⁶ His work symbolized an early attempt of “Kazakhize” science, a project consistent with the korenizatsiya (indigenization) policies of the 1920s. However, under Stalin, the cultural pluralism of the 1920s was replaced by rigid Russification and centralization. In 1938, Yermekov was arrested for article 58, for counter-revolutionary activities, which were also connected with the Alash national party.³⁷ His imprisonment not only a personal tragedy, but also a symbolic end to the early phase of Kazakh scientific autonomy. After six years in prison, Yermekov was rehabilitated in 1955, though his academic reputation could not fully recover. The Karaganda Technical University Museum portrays him as both founder and martyr of Kazakh science.³⁸

Ibadulla Akbergenov was another person, who suffered the same fate. Akbergenov was a promising lecturer in the Faculty of Physics and Mathematics at Kazakh State University, which was the reason he could be found in the record of faculty meetings in 1937 and early 1938, where he is seen engaging in departmental discussions and performing his teaching responsibilities³⁹. In her research on scholars at KazNU, Akhmetzhanova cites that his name suddenly vanished, with no institutional record, after the height of the Great Terror in late 1938.⁴⁰ None of his published works survive in any accessible catalogues written under his own name, and either of these possibilities is conceivable: in either case it appears that his work was suppressed and his research was stolen, or that it was not finished before his arrest. According to

³⁶ Biography of Alimkhan Yermekov.

³⁷ Biography of Alimkhan Yermekov.

³⁸ Biography of Alimkhan Yermekov.

³⁹ Aubakirova, K., M. Zhanibek, S. Aituganova, A. Altay, and E. Rakhmetullin. "Censorship of the Soviet Union in Kazakhstan." *Scientific Herald of Uzhhorod University. Series Physics* 56 (2024): p.8

⁴⁰ Aubakirova, K., M. Zhanibek, S. Aituganova, A. Altay, and E. Rakhmetullin. "Censorship of the Soviet Union in Kazakhstan." *Scientific Herald of Uzhhorod University. Series Physics* 56 (2024): p.9

several secondary sources⁴¹, he was caught in the same wave of purges that had attacked Yermekov and other intellectuals who were linked to the national cultural movements or had some educational background that was pre-revolutionary.

The example of Akbergenov is representative of a larger trend: to most of those, whose scholarship was repressed, the historical record records practically nothing at all but a sudden silence. It is a lack of rehabilitation papers, posthumous publishing, museum exhibitions. Akbergenov, unlike Yermekov, did not escape incarceration to live a productive life, but has been erased by the process of re-education to a greater extent, being neither rehabilitated nor repressed by the regime. Even his disappearance, then, is some sort of historical testimony - a remnant of the completeness of the Terror in destroying not only individuals but the memory of their existence as an institution. This magnitude of this erasure is one reason the history of mathematics in Soviet Kazakhstan has been the least studied: once the first generation of scholars had been erased, the foundation that could be used to recover their work was lost with them.

The purge of the late 1930s eliminated much of Kazakhstan's first generation of mathematicians. The given repression also infused a lasting culture of fear in the academic community and their lives. Professors and teachers avoided controversial topics as much as possible, self-censored their own research, and demonstrated their loyalty to the Party and its ideas above their academic originality. The atmosphere of intellectual insecurity that took hold during the Terror would persist for decades.

Despite the destruction of the first generation of Kazakh mathematicians, they did not disappear from Kazakhstan's universities. Instead, it was reconstructed by new ideological

⁴¹ The Kazakhs in Russia: Biographical collection in 2 volumes. – V.1. – Moscow: «Publishing house VeGa», 2007. – p.136. & Kazakhstan. National encyclopedia. Volume 1. A-B. Home edition “Kazakh encyclopedia”. – Almaty, 2004. – p. 135

conditions. The Soviet government understood the importance of technical expertise for industrialization and even in the period of the Second World War. As a result, institutions expanded even in the circumstances of political terror.

The Department of Higher Mathematics and Modelling at Satbayev Technical University (established in 1934) illustrates this paradox.⁴² Its history shows the contribution of the department to technological progress and the training of technical specialists. Faculty meetings included not only academic information, but also there were political discussions assessing professor's "social activity" and "loyalty". The same institution which was responsible for creating engineers and mathematicians also played a role in the mechanism of ideological discipline.

A new generation of Kazakh mathematicians developed in this new environment — those who were taught how to move on the borders of what was permissible inquiry. Among the most notable ones was Orymbek Zhautykov (1911-1989), who started working in the 1930s and achieved a successful career in the post-war years. In the post war era Zhautykov had some successes: he was appointed to the Academy of Sciences of the Kazakh SSR and Kazakh Pedagogical University, and published works such as *The evolution of numbers in Kazakh* (1949) and *Cauchy problem in a denumerable system of partial differential equations* (1949).⁴³ His work focused on the study of differential equations and mathematical physics - fields that were considered safe by the state since they were directly related to industrial planning and engineering. The MacTutor History of Mathematics Archive notes his pioneering role in creating

⁴² Department of Higher Mathematics and Modeling, *History of the Department*, Satbayev University

⁴³ O'Connor, J. J., and E. F. Robertson. "Orymbek Akhmetbekovich Zhautykov." MacTutor History of Mathematics Archive. March 2022.

the so-called Kazakh School of Differential Equations⁴⁴, in which the theory was applied to the industry without becoming the targets of political paranoia. Zhautykov had survived and prospered as a professional mathematician under Stalinism not by chance, but as a result of his choices which he made. To start with, he was only focused on applied mathematics and not theoretical or abstract mathematics. Though theoretical mathematics was sometimes derided as useless idealism unconnected with socialist aims, the direct application of the theory to the mechanical sciences and physics and engineering, which also were priorities of the Soviet industrial state, made the use of the theory straightforward. It was by basing his work on this that Zhautykov made his work readable and helpful to the regime. Second, he took important pedagogical and administrative tasks in the Soviet institutions - training students, heads of departments, and being a part of the institutional life of the Academy of Sciences. This observable interaction with Soviet scientific systems offered some form of political protection that other scholars whose primary distinction is their research did not have. Third, his choice to publish both in Kazakh and in Russian helped him to retain a connection to the intellectual traditions of the nation and at the same time to exhibit a connection into the wider Soviet academic network of which math was proclaimed to be the servant of socialist progress by the retrospective "20 Years of Soviet Mathematics" published in the journal *Uspekhi Matematicheskikh Nauk* (UMN) in 1938.⁴⁵ Zhautykov, however, managed to find a balance in these expectations: not by giving up the intellectual norms, but by placing his work with reference to the norms that the state could use effectively. His career is an example of what scholars of Soviet science have called a strategy of accommodation in neither blatantly opposing

⁴⁴ O'Connor, J. J., and E. F. Robertson. "Orymbek Akhmetbekovich Zhautykov." MacTutor History of Mathematics Archive. March 2022.

⁴⁵ "Soviet Mathematics for 20 Years (UMN 1938, 4, 3–13)." MacTutor History of Mathematics Archive. Accessed September 26, 2025.

nor enthusiastically complying with ideological demands, but how to conduct genuine research in the framework set by the system. It demanded secrecy over what happened to colleagues such as Yermekov and Akbergenov, and it entailed doing work, the framing of which was to the benefit of a repressive state. But it also left room in which mathematics knowledge would evolve and a Kazakh scientific culture would even survive to the post-Stalin era.

The experience of Zhautykov and Kudaibergenov shows that survival during the Stalinist period required not only technical competence but also a political tact. Scholars who could align their research and works with the ideology of state were rewarded with stability.

At the institutional level, Stalinist repression reshaped the situation connected with Kazakhstan's academic infrastructure. The creation of the Academy of Sciences of the Kazakh SSR in 1946 symbolized both progress and control. The Academy Journals, such as the Bulletin of the Academy of Sciences of the Kazakh SSR, celebrated scientific achievements while carefully avoiding mention of those scholars who were repressed.⁴⁶

Curricula at the university had the same patterns. Following State's orders about the connection of the education and goals of the state, mathematical education in Soviet Kazakhstan was aligned with the Soviet norms. Kazakh language was not used as the Russian language was proclaimed as the main language for scientific communication.⁴⁷ These changes fully ignored the work done by such scholars like Yermekov, who worked to develop local scientific terminology. The suppression of Kazakh language helped Kazakhstan to fully become a part of the Soviet Union, but negatively influenced its intellectual autonomy.

⁴⁶ Zhumashev, R. M., A. Zh. Myrzakhmetova, and D. Ote. "Studying the History of Education in the Works of Soviet Researchers in Kazakhstan." *Bulletin of the Karaganda University – History. Philosophy Series* 100, no. 4 (2020): 47–54. Accessed September 27, 2025.

⁴⁷ Abylkassymova, Alma. 2025. "HISTORICAL EVOLUTION OF MATHEMATICS EDUCATION IN KAZAKHSTAN: FROM THE MIDDLE AGES TO INDEPENDENCE." *International Journal of Mathematics and Physics* 16 (2).

However, even under such limitations and challenges, mathematicians found limited space for innovations. The postwar period helped to raise the new generation of mathematicians in several institutions like Satbayev University and Kazakh Pedagogical University. These departments trained generations of students who later contributed to the development of science in independent Kazakhstan. The continuity of these departments shows the resistance of scientific culture under any political limitations.

The Stalinist period represents both tragedy and progress in the area of history of Kazakh mathematicians. The Great Terror destroyed a lot of emerging intelligentsia of uprising Kazakhstan, erasing any early attempts to build a national scientific tradition. Yet, afterwards, a new generation of mathematicians, who were politically cautious and professionally trained, raised and carried the field of mathematics.

The fates of Yermekov, Zhautykov and Kudaibergenov demonstrated this dual legacy. Their lives showed how these political constraints and purges could on one side, destroy some perspective individuals, but on the other side, force others to adapt to new circumstances and develop the scientific field of their nation. Understanding this paradox helps to see the broader Soviet experience. The story of Kazakh mathematicians represents that science under control was not the victim of these limitations, but played a role of mirror: it reflected the fears and ambitions of society who aimed to control science.

A comparative perspective further illuminates the specific character of the Kazakh experience. In other Soviet republics, similar dynamics unfolded, yet with distinct local features. In Ukraine, for example, the so-called “Executed Renaissance” of the late 1920s and 1930s saw the systematic elimination of an entire generation of nationally oriented cultural and scientific

intellectuals⁴⁸. As historian Myroslav Shkandrij documents in “Russia and Ukraine: Literature and the Discourse of Empire”, Ukrainian scholars who had contributed to the flourishing of national cultural identity during the korenizatsiia period became primary targets of Stalinist repression in the subsequent decade⁴⁹. The parallel with Kazakhstan is striking: both republics experienced the destruction of a nationally oriented first intellectual generation, followed by its replacement with a Soviet-trained cohort operating under strict ideological supervision.

However, the Kazakh case also presents important distinctions from the Ukrainian one. Kazakhstan’s scientific institutions were less developed by the time of the purges, meaning that the elimination of the first generation of intellectuals left a more severe institutional vacuum. While Ukrainian universities could draw on a longer tradition of established academic culture, Kazakh institutions were still in the process of formation. As a result, the ideological reshaping of mathematical education in Kazakhstan was not merely a question of replacing one generation with another, but of reconstructing the very foundations of scientific culture from the ground up. This foundational disruption explains why figures like Zhautykov, despite working under severe constraints, occupied such a pivotal role: they were not simply continuing an existing tradition but building one under conditions of extreme political surveillance.

The experience of Kazakh mathematicians also connects to broader theoretical debates about the nature of expertise under authoritarian rule. Historian Sheila Fitzpatrick, in her influential work “Education and Social Mobility in the Soviet Union, 1921-1934”, argues that Soviet educational policy created a new technical intelligentsia defined by its functional

⁴⁸Kvitka Perehinets, "Executed Renaissance: The Erasure of Ukrainian Cultural Heritage in the Times of the Soviet Union," *Retrospect Journal*, November 22, 2020,

⁴⁹ SHKANDRIJ, M. *Russia and Ukraine: Literature and the Discourse of Empire from Napoleonic to Postcolonial Times*. McGill-Queen’s University Press, 2001.

relationship to the state rather than by intellectual autonomy.⁵⁰ This framework applies directly to the second generation of Kazakh mathematicians: figures like Zhautykov embodied precisely the kind of “Soviet specialist” that Fitzpatrick describes- technically competent, institutionally integrated and politically cautious. Their success was inseparable from their willingness to frame their work in terms acceptable to the state, demonstrating that mathematical expertise in the Soviet periphery was always a form of political performance.

IV. Post-Stalin Rehabilitation and the Legacy of Repression

The event that led to the gradual transformation of the Soviet political situation is the death of Joseph Stalin in 1953, which as a result, had a huge influence on the scientific communities among the USSR. Nikita Khrushchev’s speech at the Twentieth Party Congress in 1956⁵¹ changed the situation by rehabilitation of thousands and hundreds of people who were repressed or imprisoned during Stalinist repression period and changed the situation in terms of assessment of political repression. He mentions Lenin’s words that it is necessary for the Control Commission to start therapy work with those who suffered during Stalin’s rule period and return them to the routine to which they are psychologically prepared⁵². Khrushchev also mentioned that the term “enemy of people” which was implemented by Stalin was not used in the right way and not used against people who were real enemies to the ideology of the State. He also

⁵⁰ Fitzpatrick, Sheila. *Education and Social Mobility in the Soviet Union 1921–1934*. of *Cambridge Russian, Soviet and Post-Soviet Studies*. Cambridge: Cambridge University Press, 1979.

⁵¹ Khrushchev, Nikita. "Speech to the 20th Congress of the C.P.S.U." February 24–25, 1956. Marxists Internet Archive.

⁵² Khrushchev, Nikita. "Speech to the 20th Congress of the C.P.S.U." February 24–25, 1956. Marxists Internet Archive.

mentioned the effect of the “cult of personality”⁵³, which was growing during Stalin’s period and how it created consequences for the Soviet Union and that the given term should be denounced. In terms of Soviet Kazakhstan, this process had significant consequences for the academic part of the Kazakh community as it did not fully restore their reputation, which were disrupted or destroyed during the 1930s.

As it was mentioned, the process of rehabilitation did not restore the reputation of intellectuals who suffered from the period of Great terror, but it reshaped the intellectual landscape. Former prisoners were formally freed, families were notified that names of their relatives were cleared and academic institutions cautiously reintegrated surviving scholars. However, even the process of rehabilitation was strictly controlled and selective. The Soviet state knew that repressions were excessive, but avoided deeper criticism of the political system that produced them. As a result, the process of rehabilitation played a role of both an act of justice and as a tool to stabilize the political situation.⁵⁴

One who benefited from the process of rehabilitation was Alimkhan Yermekov. After years of imprisonment, he was officially rehabilitated in 1955. He worked in Karaganda Polytechnic Institute for a few years from 1955-1958 and then he officially retired from his academic career⁵⁵. Even though he returned to his academic life and started working for a few years, the years in prison and repression negatively affected his professional career and left an indelible stain on his achievements. He could not return his key role in shaping Kazakhstan’s mathematical research tradition that he could have before being repressed. However, the

⁵³Khrushchev, Nikita. "Speech to the 20th Congress of the C.P.S.U." February 24–25, 1956. Marxists Internet Archive.

⁵⁴Tanatarova, Zhamiga. "Repressions of 1937–1938 in Kazakhstan and Their Consequences." *International Journal of Humanities Social Sciences and Education* 2, no. 1 (2015)

⁵⁵ Biography of Alimkhan Yermekov.

rehabilitation process allowed him to continue to make contributions to mathematical education and to the early formation of national scientific terminology.⁵⁶

The process of rehabilitation also influenced institutional memory. Universities and scientific institutes began to acknowledge the contribution of silenced scholars who were not mentioned before. However, these recognitions were often symbolic and cautious. Official publications mentioned scientific achievements and at the same time, avoided any discussion about political persecution. This selective process represented the broader picture of Soviet politics which aimed to restore prosperity without confronting political repressions.

The period of time between the 1950s and 1960s was marked as a period of rapid expansion in higher education and scientific research across the Kazakh SSR. Several factors like industrial growth, space research and technological modernization increased demand for mathematicians and engineers. Higher education universities and institutions like Kazakh State University, Satbayev Technical Institute and other pedagogical universities expanded their faculties and research programs to give opportunity to local scientists and scholars to make a contribution to national scientific development. This expansion process reflected broader Soviet priorities in science and technology during the Cold War, where mathematical modeling, applied mechanics, computational methods and other scientific and technological development gained strategic importance over enemies.

Within this context, the work of Orymbek Zhautykov became more recognized. His research about the differential equations and mathematical physics contributed to applied fields that are essential for engineering and industrial development. During the postwar period of time,

⁵⁶ Biography of Alimkhan Yermekov.

he had a significant role in training and educating new specialists and shaping the mathematical landscape and research networks in Kazakhstan. Also, in his textbook called “A course of mathematical analysis”, which was published in Kazakh, there is a foreword, where it mentioned: “It has been a long time since Kazakh departments were opened in the pedagogical institutes.... Despite the fact that these departments have been around for a long time, there is still no textbook or manual on mathematics in Kazakh. Of course, thousands of Kazakh students demand that textbooks on mathematics be in their mother tongue.”⁵⁷ It shows that Zhautykov tried to solve these problems by publishing his own textbooks and works on the Kazakh language and promote his language for the development of Kazakh science. His leadership supported the process of institutionalization of what later was known as the “Kazakh school of differential equations”, connecting theoretical research with practical implementations.⁵⁸

The rehabilitation era also witnessed the strengthening of the Academy of Sciences of the Kazakh SSR, founded in 1946 but significantly expanded after Stalin’s death. According to the report, which was published in 1964 by Alexander Korol for the Center’s Study of Soviet education and research, in 1957, the number of faculty individuals increased to 1355 individuals, the number of research institutes to 21 and the budget to 91.9 million rubles.⁵⁹ The Academy became a central hub for research coordination, publication, and scientific prestige. Its journals disseminated mathematical research while reinforcing Soviet scientific norms. The Academy’s

⁵⁷ Zhautykov, O.A. “A Course of mathematical analysis”. 1958. As quoted in J.J. O’Connor & E.F. Robertson. Biography of Orymbek Zhautykov. *MacTutor*, 2022, March

⁵⁸ J.J. O’Connor & E.F. Robertson. Biography of Orymbek Zhautykov. *MacTutor*, 2022, March

⁵⁹ Korol, Alexander. Report for the Center's Study of Soviet Education and Research. Cambridge, MA: MIT, 1964, p.4

growth symbolized both intellectual development and continued central oversight, as research priorities remained aligned with state planning and industrial goals.

Despite institutional growth, the legacy of repression continued to shape academic culture. Scholars remained cautious in their professional conduct, avoiding controversial interpretations and maintaining loyalty to official ideological frameworks. The culture of self-censorship and political awareness cultivated during the Stalinist years did not disappear; rather, it became embedded in academic practice. Even younger mathematicians who had not directly experienced the Terror inherited a professional ethos shaped by caution and conformity.

At the same time, the post-Stalin era enabled limited intellectual diversification. Mathematical research expanded into areas such as functional analysis, numerical methods, and optimization theory, fields aligned with technological and scientific modernization. The expansion of graduate programs and research institutes facilitated the emergence of new generations of mathematicians trained entirely within Soviet institutions. These scholars operated within ideological boundaries but enjoyed greater professional stability than their predecessors.

Language policy also evolved in complex ways. Russian remained the dominant language of scientific communication, ensuring integration into the broader Soviet academic system. However, efforts to promote Kazakh-language education gradually reemerged, particularly in pedagogical institutions. For example, if we compare 1988 and 2004, the period of time before and after independence, the share of Kazakh-medium pupils in schools rose from 30% to 56%.⁶⁰ Even though the given period is too late to connect it to the Post-Stalin period, it still can be

⁶⁰ Fierman, William. "Language and Education in Post-Soviet Kazakhstan: Kazakh-Medium Instruction in Urban Schools." *Russian Review* 65, no. 1 (2006): p.101

relevant in the way that it shows how the situation in terms of language policy in education systems change due to different political circumstances. This development partially restored earlier efforts to localize scientific knowledge, though within a framework that prioritized Soviet unity and Russian linguistic dominance.

Rehabilitation also influenced public commemoration. During the late Soviet period, biographies and memorial publications cautiously acknowledged the contributions of repressed intellectuals. After Kazakhstan's independence in 1991, this process intensified, with historians reassessing repression and restoring figures such as Yermekov to national historical narratives. Museums, university departments, and scholarly publications began presenting repressed mathematicians as foundational figures in Kazakhstan's scientific heritage.

Thus, the post-Stalin decades did not simply mark recovery; they represented a negotiated reconstruction of scientific life shaped by memory, silence, and controlled recognition. Rehabilitation restored individuals but did not erase the institutional habits formed under repression. The mathematical community that emerged in the 1960s and 1970s combined professional competence with political caution, reflecting both continuity and change.

The post-Stalin rehabilitation process also had significant implications for archival and historiographical practice. As scholars were officially cleared of charges, their personal files, institutional records and academic works became subject to reassessment. However, as historian Nanci Adler demonstrates in the *Gulag Survivor: Beyond the Soviet System*, rehabilitation was rarely accompanied by full archival access or systematic documentation of the repression itself.⁶¹ For Kazakh mathematicians, this meant that even those officially rehabilitated, like Yermekov,

⁶¹ Adler, Nanci. *The Gulag Survivor: Beyond the Soviet System*. New Brunswick, NJ: Transaction Publishers, 2002

often returned to institutions that had little record of their earlier contribution, since such records had been deliberately suppressed or destroyed during the Terror. The rehabilitation of individuals thus coexisted with the continued erasure of institutional memory, creating an asymmetry between personal vindication and collective remembrance.

The expansion of graduate education in Kazakhstan during the 1950s and 1960s also deserves closer attention as a site of ideological negotiation. According to the 1964 report by Alexander Korol for the Center's Study of Soviet Education and Research, by 1957 the number of research institutes under the Academy of Sciences of the Kazakh SSR had grown to twenty-one, with a corresponding increase in graduate student enrollment.⁶² This expansion created new opportunities for mathematicians, but also new mechanisms of ideological control: graduate programs require mandatory coursework in marxist-Leninist theory, and dissertation committees routinely assessed the ideological soundness of research alongside its scientific merit. The process of becoming a professional mathematician in post-Stalin Kazakhstan thus still involved navigating a dual evaluation (scientific and political), even as the intensity of repression had diminished compared to the Stalinist period.

International scientific exchanges, which began cautiously during the Khrushchev era, also shaped the trajectory of mathematical research in Kazakhstan. Soviet participation in international mathematical congresses, for instance, the international Congress of Mathematicians, which was held in 1954 in Amsterdam and in 1958 in Edinburgh, signaled a desire to reconnect with global scientific communities while simultaneously demonstrating Soviet scientific prestige. For Kazakh mathematicians like Zhautykov, whose work on differential equations intersected with internationally recognized research agendas, these

⁶² Korol, Alexander. Report for Center's Study of Soviet education and research, 1964

openings created modest but meaningful opportunities to engage with scholarship beyond the Soviet borders. At the same time, such exchanges remained tightly controlled, with participation contingent on political reliability and institutional affiliation, reinforcing the entanglement of scientific achievement and political conformity that had characterized the field since the Stalinist period.

V. Conclusion

The experience of Kazakh mathematicians in the Stalinist times is a typical example of complicated relations between a development of science and political power in authoritarian regimes. Although mathematics is typically viewed as an ideologically neutral subject of study, it is clear that the institutional growth of mathematics in Soviet Kazakhstan was heavily shaped by state priorities, ideological control and political repression.

This investigation has revealed that the Stalinist repression has had a huge influence upon the career of Kazakh mathematicians in several ways. First of all, the purges in the 1930s had wiped out a good part of the first generation of nationally-oriented intellectuals. There are other examples like Alimkhan Yermekov and Ibadulla Akbergenov who are representatives of the wider category of people whose professional path has been interrupted with arrest, imprisonment or vanishing. The elimination of these shattered early attempts to forge a national disposition to the sciences, and contributed to the disruption of continuity of thought.

These results have echoes throughout the broader academic theoretical frameworks of comprehending science in authoritarian regimes. The careers of Kazakh mathematicians which were discussed in this paper demonstrate that even mathematicians were not exempted by these pressures: the need to conform ideologically, the threat of national associations, and the

encouragement to produce mathematics with a purpose and by whom it was produced, were all overriding of what was produced and by whom it was produced. The difference between the case of the Kazakh and the metropolitan Russian experience lies in the fact that these pressures of the sciences were combined with the issues of national identity and language. To the Kazakh mathematicians, the political threat was intellectual, but also ethnic and cultural. The repression of the Kazakh scientific lexicon, the harassment of intellectuals with Alash connections, the substitution of nationally-minded first generation by a Soviet-educated second generation, characterize the processes, which were not only universal to the peripheral, non-Russian republics, but also to the Soviet Union.

Second, ideological limitations altered the form and content of learning mathematics and the mathematics research. The Soviet state encouraged the study of mathematics as the means of industrialization and technology advancement and discouraged theoretical or "idealistic" approaches considered as being caught up in theoretical pursuits that were considered as being aloof from practical socialist aims. Professional development was more dependent on political dependability and ideological correctness than on academic excellence.

Third, institutional adaptation instead of institutional collapse through outright repression was beneficial to the institution. Universities and research institutes continued to function but in an atmosphere of surveillance, censorship and fear. A new breed of mathematicians had appeared, who had been educated in the Soviet ideological context and who were good at walking on the political tightrope. Scholars like Orymbek Zhautykov are its typical embodiment whose success was based on realisation of the ability of balancing research with state priorities with professional standards.

Fourth, the period of the rehabilitation after Stalin to rebuild the scientific infrastructure in Kazakhstan in dealing arbitrarily with the heritage of repression. Rehabilitation helped repair reputations and enable the institutions to grow but the memory was maintained under control of the Scientific community which was formed in the last days of existence of the Soviet Union containing the objectives and limitations of Stalinist modernization.

The Kazakh case shows, moreover, a fundamental paradox of the Stalinist science, for the single regime that had heavily invested in scientific modernization was to be one that undermined the intellectual autonomy necessary for innovation. Political suspicion and developmental ambition have existed next to each other, developing a system that encouraged as well as limited scientific development. This paradox was decisive for the individual careers; it was also decisive for the institutional life (culture) of Soviet science.

More broadly the experience of Kazakh mathematicians is part of worldwide discussions of the production of knowledge in authoritarian regimes. It is an indication of the fact that the scientific disciplines do not work in the vacuum of political structure. Instead they reflect the priorities and anxieties as well as power relationship of the societies in which they originate. In the colonial and peripheral workshops of colonial countries such as Soviet Kazakhstan, however, these dynamics were complicated by tensions between national identity, linguistic policy and centralized state control.

Understanding this history is still relevant to modern-day Kazakhstan. The revival of interest in the repressed intellectuals at the time of the post independence is part of a wider process of reconstruction of the national intellectual history and recognition of the past injustices.

At the same time, however, institutional bases established under the Soviets still persist in the scientific education and research of the present day.

Ultimately, the history of the mathematicians of Kazakhstan in the period of Stalinism allows us to learn not about science as a body of knowledge, but about it as a social institution, that is, immersed in relations of power. Their experiences represent some of those of resilience, adaptation and loss that provide insight in the survival and transformation of intellectual life under conditions of political repression.

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