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Repressed science in the service of agrarian development: The contribution of Karlag's incarcerated scientists to Soviet agricultural science, 1930s–1950s

***Abstract.** This article examines the Karaganda Agricultural Experimental Station (SKhOS) of the Karaganda Corrective Labour Camp (Karlag) as a scientific institution operating within the Soviet GULAG system in Central Kazakhstan from the 1930s to the 1950s. Despite its origins in a system of forced labour, the station made a significant contribution to Soviet agricultural science. The study is based on primary archival materials from the State Archive of Karaganda Region for Scientific and Technical Documentation (GAKO NTD, fond 26), verified through comparison with published collections of GULAG documents and memoir sources. The research employs the methods of institutional history, prosopographical analysis, and content analysis of archival scientific texts. The article reconstructs the organisational structure of SKhOS, a station comprising six scientific departments and a staff of ninety-eight employees, approximately 64 per cent of whom were prisoners. It offers a detailed analysis of the scientific contributions of seven identified prisoner-scientists:*



V. S. Pustovoit, who developed high-yielding varieties of rye and millet that tripled field productivity; S. A. Arkhangel'skii, whose vegetable-breeding programme produced zoned varieties, including a tomato variety registered in thirteen oblasts of the Kazakh SSR; A. A. Kornilov, whose experiments on photoperiodism in spring wheat hybrids and on the continuous illumination of millet challenged established assumptions in Soviet plant physiology; P. A. Vertelet'skii, who developed the drought-resistant spring wheat variety Karagandinskaia, recognised as a regional standard and sown by 1949 on an area exceeding 7,000 hectares; A. V. Lanina, whose work in livestock breeding contributed to the creation of the Kazakh White-Headed beef cattle breed, awarded the Stalin Prize in 1940; Ia. E. Vasil'tsev, who organised a systematic campaign against glanders in the camp's horse population; and B. K. Fortunatov, whose programme for breeding fine-fleeced fat-tailed sheep was interrupted by his death from brucellosis in 1940. Over two decades, SKhOS registered ninety-two new varieties of agricultural crops, sixteen of which were approved by the State Commission for Variety Testing for cultivation in several regions of the USSR. The station also supplied district seed-production farms with more than 37,837 centners of elite-category grain seed. The article argues that SKhOS represented a distinctive regime of knowledge production – coerced expert science – in which repressive institutional control, practical agrarian demand, and the professional culture of prisoner-scientists generated a contradictory yet measurable scientific outcome. The gradual absorption of the station into the mainstream of Soviet and Kazakhstani agronomy following the liquidation of Karlag in the mid-1950s is interpreted as an unrecognised transfer of scientific heritage created under conditions of state coercion. A promising direction for further research is the specialised study of the surviving issues of Transactions of the Karaganda Agricultural Experimental Station and of the holdings of the museum in Dolinka.

Keywords: *GULAG science; coerced knowledge production; expert knowledge under coercion; camp economy; Central Kazakhstan; Stalin-era biology*

Introduction.

The history of Soviet science during the Stalinist era encompasses one of its most paradoxical phenomena: the emergence of 'repressed science' – scientific activity carried out by specialists imprisoned within the Gulag camp system. The Karaganda Corrective Labour Camp (Karlag), established in Central Kazakhstan in 1931, became one of the largest centres for the concentration of scientific and technical personnel within this camp-based empire. The camp's agrarian complex – the state farm Gigant – required qualified specialists not only as a labour force but also as researchers. In response to this need, the Karlag administration established a network of research laboratories, which in 1938 were consolidated into the Karaganda Agricultural Experimental Station (Selskokhoziaistvennaia Opytnaia Stantsiia, hereafter SKhOS).

The scientific legacy of Karlag remains insufficiently studied. Existing historiography addresses the general history of political repression in Kazakhstan (Shaimukhanov & Shaimukhanova, 1997; Dilmanov, 2001; Kuznetsova, 2013),

documents individual biographies of repressed intellectuals (Mogil'nitskii, 2001), and provides historiographical overviews of the broader subject (Abdrakhmanova, 2020). However, the detailed institutional and scientific content of the SKHOS—its organisational structure, the specific research conducted by particular scholars, the archival texts of their work, and their concrete results—has not been subjected to systematic scholarly analysis based on primary archival sources.

The article asks not only what scientific results were achieved at SKhOS, but also how precise agricultural knowledge could be produced within an institution founded on coercion, security-regime control, and restricted scholarly communication. Its contribution lies in examining SKhOS as a scientific institution operating under the conditions of the camp system – a distinctive regime of knowledge production in which repressive power, the practical demand for expert competence, and the professional culture of prisoner–scientists formed a contradictory yet productive institutional configuration.

This article aims to address this gap in the literature. It is based primarily on materials from the State Archive of the Karaganda Region for Scientific and Technical Documentation (GAKO NTD), Fond 26—the collection of the Karaganda Research Institute of Plant Cultivation and Breeding, which originated from Karlag's Scientific Cabinet—as well as on published documentary collections on the Gulag (Kokurin & Petrov, 2000), a reference work on the system of corrective labour camps (Smirnov, 1998), and scholarly studies on repressed science in the USSR (Iaroshevskii, 1991; Markova, Volkov, Rodnyi, & Iasnyi, 1998). Memoir sources – including the recollections of former prisoner A. Berg, published in the Karaganda press (1989), and family memoirs by the daughter of I. K. Fortunatov (Pankov, 2019) – complement the archival evidence.

The article pursues three principal objectives: first, to outline the institutional history and organisational structure of the SKHOS; second, to reconstruct the scientific biographies and research contributions of key prisoner–scientists; and third, to assess the broader significance of Karlag's scientific activity within the context of both Soviet agrarian history and the history of repressed science.

Literature Review.

The subject of repressed science in the USSR began to attract sustained scholarly attention only in the late 1980s, when the policy of glasnost under Mikhail Gorbachev enabled researchers to engage with previously prohibited topics. A landmark collective volume, *Repressed Science* (Iaroshevskii, 1991), brought together contributions from leading Soviet historians, philosophers, and scientists who examined the mechanisms through which the Stalinist administrative–command system distorted and suppressed scientific development. Academician M. G. Iaroshevskii (1991) analysed the fate of Soviet science as a whole, while V. S. Kirpichnikov's chapter on Nikolai Vavilov and genetics highlighted the particularly destructive impact on the biological sciences. The editors concluded that ideologically orchestrated 'discussions' constituted the principal

mechanism of repression, their true purpose being the complete subordination of all Soviet scholars to Party control.

With regard to Kazakhstan, the first serious attempts to interpret repression and the camp system emerged in journalistic publications of the late 1980s – articles by V. Dik (1990) and E. Kuznetsova (2013) in the regional press. Although not academic in nature, these works stimulated broad public and scholarly interest in the subject. The first monograph to examine Karlag systematically was D. A. Shaimukhanov and S. D. Shaimukhanova's *Karlag* (1997), based on materials from the archive of the Karaganda Regional Directorate of Internal Affairs and addressing, *inter alia*, the conditions of detention and the scientific activity of prisoner-scholars. S. Dilmanov's study (2001) analysed the economic utilisation of prisoner labour within the camp system of Kazakhstan, providing statistical data on both agricultural and industrial output. E. B. Kuznetsova (2013) produced the most comprehensive general history of Karlag to date, situating it within the broader context of Soviet penal history.

More specifically on the question of science in Karlag, K. K. Abdrakhmanova (2013, 2020) made two significant contributions: first, a study of the research activities of prisoner-scientists at the SKHOS during the 1930s-1950s based on archival materials and memoirs; and second, a historiographical review of the literature on Karlag's scientific and creative intelligentsia. In her 2020 work, Abdrakhmanova demonstrated that the history of the SKHOS had not been the subject of comprehensive archival investigation and characterised the field as both underdeveloped and innovative.

Russian historiography on science in the Gulag includes studies by E. V. Markova, V. A. Volkov, A. N. Rodnyi, and V. K. Iasnyi (1998, 1999), which examine prisoner-scientists in the Vorkuta and Pechora camps, thereby providing a comparative framework for understanding the Karlag case. Western historiography, represented by the works of Zbigniew Bzhezinskii (1990), Hannah Arendt (1996), and Aleksandr Solzhenitsyn – whose *The Gulag Archipelago* (1989) offered the first major literary-documentary portrayal of the camp world – has tended to focus primarily on the political and systemic dimensions of Stalinism, paying comparatively less attention to its scientific aspects.

In situating the case of SKhOS within international historiography, particular importance attaches to studies on the history of Soviet science and its dependence on political and institutional context. The works of N. Kremontsov (1997), E. Pollock (2006), and A. Kojevnikov (2004) have shown that Soviet science in the Stalinist and post-Stalinist periods cannot be understood solely through the binary opposition of 'science versus ideology'. It is more productive to approach it as a system in which scientific disciplines, professional communities, state funding, party control, and institutional patronage were closely interconnected. In this respect, the history of SKhOS in Karlag represents an especially concentrated example of such dependence: here, the state patron of science simultaneously functioned as a repressive authority, an economic client, and a supervisory body.

The historiography of Lysenkoism and Soviet biology is of particular relevance. The studies of D. Joravsky (1970), N. Kremontsov (1997), and N. Roll–Hansen (2005) make it possible to examine biological and agronomic works of the 1930s and 1940s not merely as scientific texts, but also as components of an ideologically charged field in which concepts such as ‘Michurinist biology’, ‘directed upbringing’, and criticism of classical genetics carried not only methodological but also political significance. For the analysis of SKhOS, this is especially important with regard to A. A. Kornilov’s work on photoperiodism.

No less important are studies of scientific labour within the GULAG system. A. Siddiqi’s work (2017) on specialists in Stalinist ‘sharashki’ and G. Alexopoulos’s research (2017) on medical research laboratories in the GULAG show that the coerced use of expert knowledge was a stable practice of the Soviet repressive system. Most such studies, however, have focused on engineering and medicine. The case of Karlag is fundamentally different in that it demonstrates an agrarian form of camp science.

Studies of the GULAG economy – above all the works of P. Gregory and V. Lazarev (2003), and S. Barnes (2011) – allow Karlag to be viewed not only as a space of punishment, but also as an element of the Stalinist mobilisation economy. Particular attention should be given to S. Barnes’s monograph ‘Death and Redemption: The Gulag and the Shaping of Soviet Society’ (2011), based on materials from Kazakhstani and Russian archives, which proposed a conception of the GULAG as a ‘total institution’ aimed at transforming the individual through forced labour. Barnes considered Karlag as a point of intersection between punishment and ‘reforging’, a framework that may be correlated with the mechanism for mobilising expert knowledge at SKhOS: repressive power destroyed the biographies of scientists, yet at the same time preserved and exploited their professional competence.

The present article develops the existing historiography by systematically combining the content of specific archival scientific works produced at SKhOS with the biographical profiles of their authors. Its key historiographical contribution lies in demonstrating that Karlag scientists preserved theoretical scientific standards even under conditions of isolation, thereby complicating the thesis that GULAG science was purely applied in character.

Methodology and Source Analysis.

The methodological framework of this study is shaped by the need to examine SKhOS simultaneously as a scientific institution, a subdivision of the camp economy, and part of the broader system of Soviet agrarian modernisation. The article combines approaches drawn from institutional history, the history of science, the social history of forced labour, and the source–critical analysis of departmental documentation.

The main body of sources consists of materials from fond 26 of GAKO NTD. Documents were selected according to their relevance to three interconnected levels of SKhOS history: the organisational structure of the station, the content of its scientific research, and the biographies of its specialists. The analysis includes annual plans, reports, memoranda, official correspondence, manuscripts of scientific articles,

materials from the station's 'Transactions', statistical data on personnel composition, and documents relating to variety testing and seed production.

Archival data were verified through cross-comparison: information contained in official reports was correlated with memoir evidence, including the recollections of A. Berg and the family memoirs of I. K. Fortunatov's daughter. NKVD–MVD documentation is interpreted with due regard to its specific institutional character: official production reports generally tended to understate human costs and exaggerate achievements, whereas internal correspondence often recorded structural contradictions with greater frankness. Where archival documents do not allow the legal status of a researcher to be established with certainty – as in the case of P. A. Verteletskii – this circumstance is explicitly noted in the text.

The methods employed include the comparative–historical method, used to compare Karlag with the Vorkuta and Pechora camps as well as with 'sharashki'; the chronological method, used to reconstruct the institutional history of SKhOS; prosopographical analysis, used to compile collective biographical profiles of prisoner–scientists; and content analysis of archival scientific texts, which makes it possible to assess their theoretical level and methodological rigour. The limitations of the study are connected with the character of the surviving sources: the documents of fond 26 make it possible to reconstruct the institutional activity of the station, but do not always allow the complete biographies of its personnel, their legal status, or the mechanisms of internal control to be established.

Main Research Results.

1. Karlag: Institutional Structure and Scale.

The Karaganda Corrective Labour Camp (Karlag) was officially established on 17 September 1931 on the basis of the state farm Gigant, which had been created in 1930 by the Kazakhstan ITL of the OGPU (Smirnov, 1998). The administrative centre of the camp was located in the settlement of Dolinka, approximately 45 kilometres south of Karaganda. The camp occupied a territory of 1,767,024 hectares – extending approximately 300 kilometres from north to south and 150–200 kilometres from east to west – situated at the juncture of the dry steppe and semi-desert zones (Kokurin & Petrov, 2000, p. 763).

The camp's principal function was agricultural production: the creation of a major food–supply base for the rapidly developing coal and metallurgical complex of Central Kazakhstan – the Karaganda coal basin and the Dzhezkazgan and Balkhash copper–smelting combines. In GULAG documents, Karlag was explicitly characterised as a specialised sheep–breeding camp, which distinguished it from other large agricultural camps, such as Siblag, which specialised in pig breeding. By 1940, the camp held 148,425 sheep, including 93,000 ewes; 21,296 head of cattle, including 6,413 cows; as well as substantial numbers of horses, camels, and pigs. The camp's sown area amounted to approximately 69,000 hectares of grain, oilseed, vegetable, and fodder crops (Kokurin & Petrov, 2000, pp. 763–764).

The number of prisoners in Karlag increased substantially over the course of its existence: from 10,400 individuals in December 1932 to a peak of 65,673 by January 1949, after which it began to decline, reaching 16,957 by January 1959 (Smirnov, 1998). In 1940, the total prisoner population stood at 34,536, of whom 19,181 had been convicted of ‘counter-revolutionary crimes’— a category encompassing the overwhelming majority of the camp’s intelligentsia and specialists (Razgon, 1994, p. 17). Among these so-called ‘counter-revolutionaries’ were hundreds of agronomists, zoologists, geneticists, veterinary specialists, and soil scientists whose expertise proved indispensable to the camp’s agrarian mission.

The climatic conditions of the region posed formidable challenges to both scientific and agricultural work. The area was characterised by a sharply continental climate, with average annual precipitation of around 200 millimetres, winters with minimal snowfall and temperatures dropping to -47 to -48°C , short and hot summers, and poor light chestnut soils frequently affected by solonetz formations (saline soils). As stated in an internal report of the SKHOS submitted to the Council of Ministers of the Kazakh SSR in 1950, these conditions ‘seemed to constitute an insurmountable obstacle to the development of agriculture in this territory, where for centuries only one branch of agriculture—nomadic pastoralism—had existed’ (GAKO NTD, F. 26, Op. 3–1, D. 353a, L. 138).

2. Scientific Cabinet and SKhOS: Organisational Structure.

2.1 From the Scientific Cabinet (a research unit within the camp administration) to the SKHOS.

Scientific work within the Karlag system began almost simultaneously with the establishment of the camp itself. In May 1931, the OGPU organised a Scientific Cabinet within the Karaganda camp, located on the lands of the Karaganda state farm in the central settlement of Dolinka, covering a total area of 3,000 hectares where experimental fields were established (GAKO NTD, F. 26, Op. 3–1, D. 287, L. 95). In its initial years, the Scientific Cabinet comprised several specialised experimental units—dryland (rain-fed), irrigated, and liman (floodwater-retention) experimental fields, as well as an agrochemical laboratory—each addressing specific challenges of agriculture under the semi-desert conditions of Central Kazakhstan.

By a resolution of the Council of People’s Commissars of the USSR dated 29 April 1938, all existing research and experimental units of the Karaganda state farm were consolidated into a single integrated institution: the Karaganda Agricultural Experimental Station (Selskokhoziaistvennaia Opytnaia Stantsiia, SKhOS). At the same time, under a special agreement between the Karlag administration and the Main Variety Administration of the People’s Commissariat of Agriculture of the USSR, the SKHOS assumed the functions of the Karaganda Regional State Breeding Station. In this capacity, it became responsible not only for meeting the internal needs of the camp’s agrarian complex but also for conducting state varietal testing and producing elite seed stock for the entire Karaganda and Akmolinsk regions – that is, for territories

later incorporated into the Virgin Lands of Kazakhstan (GAKO NTD, F. 26, Op. 3–1, D. 353a, L. 255).

2.2 Departmental Structure.

The SKHOS was organised into a number of scientific departments, the composition of which evolved over time. By the mid-1940s, according to an internal memorandum addressed to the head of Karlag's Political Department (GAKO NTD, F. 26, Op. 3–1, D. 353a, L. 255–257), the station comprised six major departments:

Department of Plant Breeding and Seed Production of Cereals, Oil Crops, and Fodder Grasses – responsible for developing new varieties of wheat, rye, millet, barley, oats, sunflower, and perennial grasses adapted to local conditions.

Department of Agrotechnics and Agrochemistry – responsible for the study of crop rotation systems, methods of soil cultivation, the application of fertilisers, and the implementation of grass–field (ley farming) systems of agriculture.

Department of Vegetable Cultivation – responsible for the breeding, seed production, and agronomic practices of potatoes, tomatoes, cucumbers, cabbage, melons, watermelons, and other vegetable and cucurbit crops.

Department of Horticulture – established in 1945, responsible for the introduction and testing of fruit and berry crops and, from that time, for the development of new locally adapted varieties suited to the harsh climatic conditions of Central Kazakhstan.

Department of Plant Physiology and Microbiology – responsible for theoretical research in plant physiology, photoperiodism, drought resistance, frost resistance, and applied microbiology.

Department of Plant Protection – responsible for identifying pests and plant diseases and for developing methods of their control.

Supporting units included a Scientific Library, a Scientific Archive, a photographic laboratory, and a meteorological station. The total number of scientific personnel at the station ranged from 70 to 98 individuals, depending on the period (GAKO NTD, F. 26, Op. 3–1, D. 353a, L. 255, 68–69).

2.3 Personnel Composition: Prisoners and Civilian Staff.

One of the most distinctive and ethically complex features of the SKhOS was its dual personnel structure: the station's research staff included both civilian employees and prisoners. An official report submitted to the Council of Ministers of the Kazakh SSR in 1949—at the time when the camp population reached its peak (GAKO NTD, F. 26, Op. 3–1, D. 353a, L. 68–69)—provides the following breakdown of the station's scientific and production personnel, which totalled 98 individuals (Table 1).

This table reveals a fundamentally important structural reality: prisoners constituted approximately 64% of the total scientific and production personnel. At the level of senior research fellows – that is, among those directly responsible for designing and conducting experiments – prisoners and civilian staff were represented in almost equal proportions (11 prisoners compared to 12 civilians). Among junior research staff and technical laboratory personnel, however, prisoners overwhelmingly predominated

(9 of 16 junior researchers; 41 of 45 agronomists and laboratory assistants). Administrative and managerial positions – director, deputy director, and heads of departments – were occupied exclusively by civilian personnel, the majority of whom were career officers of the NKVD–MVD or specialists entrusted by them.

Table 1. Personnel Composition of the SKhOS by Category (1949).

Position	Civilian Staff	Prisoners	Total
Director	1	–	1
Deputy Director for Research	1	–	1
Scientific Secretary	1	–	1
Heads of Departments	6	–	6
Senior Research Fellows	12	11	23
Junior Research Fellows	7	9	16
Agronomists and Laboratory Assistants	4	41	45
Head of Library	1	–	1
Artists and Photographers	2	2	4
Total:	35	63	98

Source: State Archive of the Karaganda Region for Scientific and Technical Documentation (GAKO NTD), Fond 26, Opis' 3–1, Delo 353a, fols. 68–69.

On a broader scale, archival materials indicate that prior to the Second World War Karlag held 159 highly qualified agronomists, 70 livestock specialists in cattle breeding, 32 veterinary surgeons, 56 veterinary assistants, and 15 sheep-breeding specialists. These figures increased significantly after the war: by 1950, more than 200 agronomists were employed in the camp's agricultural enterprises (Abdrakhmanova, 2013, p. 63; Shaimukhanov & Shaimukhanova, 1997, p. 136).

2.4 Agricultural Zones Served by the SKhOS.

The scientific output of the SKhOS was directed not only towards meeting the internal production needs of Karlag but increasingly towards servicing the collective and state farm sector of the Karaganda and neighbouring regions. A list of kolkhozy, sovkhozy, and subsidiary farms included in suburban zones and specialising in the cultivation of potatoes, vegetables, fruit, berries, and dairy production—attached to Resolution No. 807 of the Council of Ministers and the Central Committee of the Communist Party (Bolsheviks) of Kazakhstan, dated 19 August 1950 – clearly illustrates the geographical scope of the SKhOS's practical influence (Table 2).

3. Scientists, Their Works, and Scientific Contributions.

3.1 Vasilii Stepanovich Pustovoit: Plant Breeding under Conditions of Imprisonment.

Vasilii Stepanovich Pustovoit (1886–1972) was among the first and most prominent scientists to work in Karlag. Prior to his arrest in August 1930 in Krasnodar,

he had established the experimental breeding station Kruglik near Ekaterinodar, headed a department at the Kuban Agricultural Institute, and enjoyed a reputation as one of Russia's leading specialists in plant breeding. Convicted by the OGPU Collegium under Articles 58–7, 58–10, and 58–11 as an ‘enemy of the people’ and sentenced to ten years in a corrective labour camp with confiscation of property, he was sent to Karlag, where he was assigned to the research laboratory of the state farm Gigant (Abdrakhmanova, 2013, p. 62; Mogil’nitskii, 2001, p. 88).

Table 2. Agricultural Zones Served by the SKHOS (as of 1950).

Zone	Districts	Included Farms
Karaganda and Temirtau Zone	Telman District	All 25 kolkhozy
	Osakarov District	7 kolkhozy: Internatsional’nyi, Zaishimskii, Pionerskii, Osakarovka, Toksumak, Peredovik, Iuzhnyi
	Voroshilov District	2 kolkhozy: Vozrozhdenie and imeni Kirova; State farms No. 1, 3, 4, and Dubovka under the Ministry of State Farms of the Kazakh SSR
Zhezkazgan Zone	Zhezkazgan District	8 kolkhozy: Balazhezdy, Ornek, imeni Kirova, imeni Voroshilova, Pioner, Baikonur, Talap, Kyzyl Asker; subsidiary farms of the copper smelting combine
Balkhash Zone	–	Subsidiary farms of the copper smelting plant and Pribalkhashstroï
Ekibastuz Zone	–	Subsidiary farm of Irtyshuglestroi

Source: State Archive of the Karaganda Region for Scientific and Technical Documentation (GAKO NTD), Fond 26, Opis’ 3–1, Delo 353a, fol. 127.

Pustovoiť’s contribution to the SKHOS during his imprisonment – initially until his early release in May 1934, and subsequently as a civilian director of the Central Experimental Field of the Karaganda camp until March 1935 – was of foundational significance. He developed a high-yielding variety of rye and two varieties of millet—the so-called ‘Dolinka’ varieties—which increased field productivity threefold. His detailed study of local soils enabled him to propose replacing deep ploughing, which inverted the 14–15 cm fertile chernozem layer beneath infertile saline subsoil, with disc cultivation, a method that proved far more effective under the specific soil conditions of the Karaganda steppe.

Pustovoiť’s name appears among the authors of the winter rye variety Dolinskaia in the official nomenclature of the State Commission for Variety Testing, as recorded in the SKHOS report of 1951: ‘Winter rye Dolinskaia – authors V. S. Pustovoiť, V. I. Sazanov, and L. I. Eremin’ (GAKO NTD, F. 26, Op. 3–1, D. 353a, L. 167). This

variety was subsequently zoned (approved for cultivation) in five regions of the Kazakh SSR and in Primorskii Krai of the Russian SFSR.

Following his release and departure from Kazakhstan in 1936, Pustovoi continued his scientific career in sunflower breeding and achieved outstanding distinction: he was twice awarded the title Hero of Socialist Labour, became first a Corresponding Member and later a Full Member of the All-Union Academy of Agricultural Sciences (VASKhNIL; 1956) and the Academy of Sciences of the USSR (1964), and was the recipient of both the Lenin Prize and the Stalin Prize.

3.2 Sergei Aleksandrovich Arkhangel'skii: A Prisoner – Vegetable Specialist.

Sergei Aleksandrovich Arkhangel'skii (1900–1962), an agronomist and plant-breeder, headed the Department of Vegetable Cultivation at the Karaganda Agricultural Experimental Station of the NKVD state farm from 1941 onwards. His scientific work during his time in Karlag was exceptionally productive, encompassing both theoretical and applied dimensions.

As early as 1932, Arkhangel'skii conducted the first systematic trials of vegetable and field crop varieties under irrigation conditions in the Karaganda region, aiming to identify varieties suitable for a zone that, for many crops—particularly vegetables—represented an entirely new cultivation area. His report, 'Varietal Testing of Vegetable (and Field) Crops under Irrigation' (1932), established baseline agronomic data for potatoes, white cabbage, cauliflower, tomatoes, watermelons, cucumbers, and carrots under irrigated conditions in the Karaganda steppe.

Arkhangel'skii's archival article of December 1940 represents a rare example of institutional self-assessment within Soviet scientific record-keeping. Combining a report on achievements with an energetic critique of structural shortcomings, it exposes the central contradiction of SKhOS as a scientific enterprise embedded within the administrative system of the camp. The assertion that the station ranked first among sixty-three breeding research institutions of the People's Commissariat of Agriculture in terms of the number of varieties transferred to the state variety-testing network – twenty-seven between 1937 and 1940 – indicates that the scientific results of SKhOS were not peripheral to the Soviet agrarian system. Rather, they were recognised at the regional level and, in some cases, at the all-Union level, despite the camp context in which they were produced (GAKO NTD, F. 26, Op. 3–1, D. 277, L. 6–7).

At the same time, the self-critical section of the article – recording the failure to fulfil the snow-retention plan, which had reached only 15 per cent by December, the shortage of building materials for greenhouses, and delays in systematic agronomic planning – points to a structural contradiction. The Karlag administration treated SKhOS as an ordinary division of the state farm, while failing to take adequate account of the specific nature of experimental scientific work and of the resources it required (GAKO NTD, F. 26, Op. 3–1, D. 277, L. 9).

Arkhangel'skii's breeding achievements in potato cultivation – three varieties exceeding the standard yield by 50-55 per cent and occupying more than 1,000 hectares by 1949 – together with the zoning of the tomato variety 'Erliana Dolinskaia 142' in

thirteen oblasts of the Kazakh SSR, confirm that practically verifiable agricultural research conducted by prisoner–scientists could produce genuinely measurable results even under conditions of chronic resource scarcity (GAKO NTD, F. 26, Op. 3–1, D. 353a, L. 24, 167–168).

Thus, the material concerning Arkhangel'skii reveals the central paradox of SKhOS: an institution deprived of administrative and legal autonomy nevertheless preserved a space for professional scientific measurement, precisely because varietal yield and resistance to frost could not be adjusted by ideological decree.

Other works attributed to Arkhangel'skii in archival records include the articles 'Science Conquers the Steppe' (1940), 'Conquering Nature' (1940), 'Agriculture in the Desert' (1940), and 'The Experimental Station of the Karaganda NKVD State Farm' (1941), all of which were published in the regional press and specialised agricultural journals.

After completing his sentence, Arkhangel'skii continued his work in scientific institutions of the Kazakh SSR, publishing research on potato and vegetable cultivation until his death in 1962.

3.3 Aleksandr Aleksandrovich Kornilov: Plant Physiology and Genetics at the Forefront of Soviet Science.

Aleksandr Aleksandrovich Kornilov served as deputy director of SKhOS for scientific affairs. His archival writings represent the most theoretically ambitious works produced at the station.

Kornilov's work must be considered in the context of Soviet biology in the 1940s, when the boundaries between plant physiology, plant breeding, genetics, and the ideologically sanctioned 'Michurinist biology' were especially fraught. By the mid-1940s, classical genetics was already under intense political pressure, and after the August 1948 session of VASKhNIL – the All-Union Academy of Agricultural Sciences named after V. I. Lenin – Lysenkoism acquired institutionally entrenched dominance. In this context, Kornilov's terminology – 'the control of development', 'directed upbringing', and the decisive role of external conditions – reflected not only the language of experimental agrobiolgy, but also the compulsory discursive regime of Soviet science. Yet his experiments on photoperiodism should not be reduced to ideological rhetoric. They demonstrate substantive experimental work with plant developmental phases, light regimes, and hybrid material. It is precisely this combination of ideologically permissible language and scientifically significant experimental practice that makes Kornilov's work especially important for the history of Karlag science.

Kornilov was the author of two archival scientific articles preserved in fond 26. Both were published in the Transactions of the Karaganda Agricultural Experimental Station – in issue 2 (1946) and issue 3 (1946) – which, despite being camp publications of limited circulation, were distinguished by a genuinely high scholarly standard.

Kornilov's two archival texts together constitute a single research programme directed against established dogmas in plant physiology. In the first article, he argues

that photoperiodic treatment of wheat hybrids at the critical moment of the light stage – a 10–11-hour day from the emergence of the second leaf to the formation of the fifth – made it possible to regulate the productivity of the ear, almost doubling grain set. In doing so, he translated the Michurinist principle of the plasticity of heredity into a concrete agrotechnical instrument (GAKO NTD, F. 26, Op. 3–1, D. 392, L. 3–7). In the second article, Kornilov criticises Razumov’s thesis concerning the necessity of darkness for short-day plants, demonstrating that millet under continuous illumination nevertheless proceeds to panicle emergence – later and with a different morphology, but nevertheless does so (GAKO NTD, F. 26, Op. 3–1, D. 393, L. 10). He explains this process through Kholodnyi’s hormonal hypothesis (1939), according to which generative development is determined not by the light/dark rhythm, but by the accumulation of a complex of phytohormones. Taken together, the two texts demonstrate a single methodological position: Kornilov consistently replaces binary physiological schemes – long day/short day, light/darkness – with dynamic models in which controlled environmental conditions and the hormonal balance of the plant are more important than rigid categorical distinctions.

The scientific significance of this work extends beyond its immediate agronomic context. Kornilov’s challenge to Razumov’s formulation – published under conditions of almost complete scholarly isolation, without access to international journals, and using laboratory equipment assembled from camp resources – indicates that the intellectual standards of Karlag scientists were not merely pragmatic or applied, but genuinely theoretical.

From the perspective of the Lysenkoist context, it is significant that Kornilov publicly challenged an accepted Soviet formulation at a time when any disagreement with official authorities was becoming increasingly dangerous. This raises the question of whether Karlag’s physical and administrative remoteness from Moscow’s scientific centres may have provided a certain space for intellectual independence, one that was unattainable for ‘free’ scientists operating under the pressure of ideological conformity.

3.4 P. A. Verteletskii: Breeding Wheat for the Steppe.

Pavel Aleksandrovich Verteletskii is identified in the archival documents of Fond 26 as the author of one of the most successful breeding achievements of the SKhOS – the spring wheat variety Karagandinskaia. This variety was developed through a method of complex (stepwise) hybridisation involving three components – Milturum 321 × Pseudo-Gostianum S.305 × Lutescens 78 – combined with accelerated breeding techniques. The result was a variety characterised by an awnless, pubescent ear and red grain, combining drought resistance with high yield (exceeding the zoned standard variety Caesium 111 by more than 2 centners per hectare), as well as resistance to shattering and to diseases such as smut and rust (GAKO NTD, F. 26, Op. 3–1, D. 353a, L. 21–22).

By 1949, Verteletskii’s Karagandinskaia wheat was sown on more than 7,000 hectares in the collective and state farms of the Karaganda region and had been zoned by the State Commission as a standard variety for the region (GAKO NTD, F. 26,

Op. 3–1, D. 353a, L. 167). In a broader report submitted by the SKHOS to the Council of Ministers of the Kazakh SSR (1949), the variety is listed among the station's key achievements. The report also describes the continuation of breeding work involving branched wheat forms, including the production of 17,200 hybrid grains and the accelerated propagation of the most promising lines in greenhouses during the winter of 1950–1951 (GAKO NTD, F. 26, Op. 3–1, D. 353a, L. 22–23).

Archival sources do not provide complete biographical information regarding Verteletskii's legal status during his work at the SKHOS. Nevertheless, his identification in the documents as a researcher at the experimental station of the Karaganda NKVD state farm—at a time when the overwhelming majority of senior researchers were either prisoners or former prisoners employed under conditions of restricted freedom—places him within the broader community of repressed specialists who shaped the scientific agenda of the SKhOS.

3.5 Anna Vladimirovna Lanina: Livestock Breeding and the Stalin Prize.

Anna Vladimirovna Lanina (born 1905), a livestock specialist and breeder and a former staff member of the All-Union Institute of Animal Husbandry in Moscow, arrived in Karlag in 1939. She initially worked as Chief Zootechnician of the Livestock Department and, from 1940, headed the Research Station for Animal Husbandry, where she conducted breeding work with cattle.

The breeding programme in which Lanina played a leading role culminated in the creation of the Kazakh White-Headed breed of cattle—a meat and dual-purpose (meat-and-dairy) breed characterised by an average live weight of 540 kg for cows (with the best specimens reaching up to 800 kg) and up to 1,100 kg for bulls. Dairy-oriented cows produced up to 3,000 kg of milk per lactation. The breed was specifically adapted to year-round pasture conditions in semi-arid environments, combining high meat productivity with the ability to withstand the harsh climatic conditions of Central Kazakhstan.

This achievement was the result of several years of research conducted within Karlag. The origins of this work can be traced to the Proceedings of the Karlag Scientific Cabinet (1933), where studies on the utilisation of Kazakh livestock and the pastures of Central Kazakhstan emphasised the importance of incorporating local breeds into breeding programmes. Researchers focused on crossbreeding native cattle with Kalmyk and Hereford breeds. Investigations initiated by V. S. Garkavi were brought to fruition through the successful experiments of A. V. Lanina, resulting in the development of the Kazakh White-Headed breed, noted for its high productivity and adaptability to the sharply continental and severe climatic conditions of the region (GAKO NTD, F. 26, Op. 3–1, D. 90, L. 9).

In 1940, Lanina was awarded the title of Laureate of the State (Stalin) Prize for her achievements in animal husbandry and the development of this new cattle breed. This recognition is noteworthy in two respects: it demonstrates that her scientific contribution was acknowledged at the highest level of the Soviet state; at the same time, archival evidence indicates that the award did not result in any mitigation of her

sentence or early release (GAKO NTD, F. 26, Op. 3–1, D. 287, L. 22). The disjunction between scientific recognition and legal–political status was absolute: a recipient of the Stalin Prize remained a prisoner without rights. Only in 1951 did the award finally serve as grounds for the removal of her criminal conviction.

Following her release, Lanina taught at the Alma-Ata Zooveterinary Institute and subsequently worked within the All-Union Academy of Agricultural Sciences (VASKhNIL) until 1988.

3.6 Iakov Efimovich Vasil'tsev: Veterinary Science under Camp Conditions.

Professor Iakov Efimovich Vasil'tsev of the Kursk Veterinary Institute served his sentence in Karlag as a leading specialist in the control of glanders—a highly contagious bacterial disease that posed a serious threat to the camp's many thousands of horses. Vasil'tsev led expeditions across the camp's extensive territory to identify infected animals, developed protocols for the isolation of diseased horses, and organised systematic diagnostic and anti–epizootic measures on a scale previously unprecedented in the region (GAKO NTD, F. 26, Op. 3–1, D. 287, L. 75).

Following his release from Karlag, he was appointed Chief Veterinary Surgeon of the Karaganda State Farm Trust—a telling indication that the authorities regarded his expertise as too valuable to permit his return to central scientific institutions.

3.7 Boris Konstantinovich Fortunatov: Sheep Breeding and Personal Tragedy.

Boris Konstantinovich Fortunatov (1886–1940)—not to be confused with his brother Igor Konstantinovich Fortunatov—followed a remarkable life trajectory, moving from revolutionary politics to zoological science. A member of the Socialist Revolutionary Party, he commanded a cavalry detachment during the Civil War before joining the Red Army. In the 1920s, he worked as a manager of nature reserves in Ukraine and Crimea and served as Deputy Director of the Askania–Nova Reserve, where he was engaged in the restoration of the European bison through absorptive crossbreeding. Arrested in 1933 as a 'former SR' and sent to Karlag, he was appointed head of the Research Station for Animal Husbandry, where he led efforts to develop semi–fine wool fat–tailed sheep producing combing wool (Abdrakhmanova, 2013, p. 63).

The breeding of fine–fleeced fat–tailed sheep in Karlag represented a scientifically complex undertaking. Archival materials from Fond 26—including the 1939 work plan for the development of fine–wool fat–tailed sheep (GAKO NTD, F. 26, Op. 3–1, D. 227, L. 1–4) – describe in detail three methods employed within the camp's breeding programme: the use of partially developed stock that had formed spontaneously within the state farm flocks; interbreeding first–generation crossbreeds, which yielded approximately two rams per 1,000 animals with small fat tails and first–class hybrid wool; and backcrossing first–generation hybrids with purebred fat–tailed sires—a method that was in fact adopted in Karlag due to the absence of a sufficiently large hybrid population required for the second approach. The programme produced its first individual animals combining fine fleece with properly developed fat tails as

early as 1938; specific specimens (rams Nos. 424, 581, and 639, and ewes Nos. 75 and 137) are documented in archival photographs and planning materials (GAKO NTD, F. 26, Op. 3–1, D. 227, L. 4).

Fortunatov's work was tragically cut short. In 1940, he contracted brucellosis—a bacterial infection endemic among the camp's livestock—and died in the Dolinka camp hospital. His death exemplifies one of the most acute structural risks faced by prisoner–scientists in Karlag: the lack of adequate medical protection and direct exposure to zoonotic diseases during field research. Following his death, the programme for the development of fine-wool fat-tailed sheep in Karlag was discontinued (Abdrakhmanova, 2013, p. 63).

4. Scientific Achievements: Results and Scale.

The cumulative scientific output of the SKhOS between 1931 and 1951 would be noteworthy for any research institution; when considered in light of the conditions under which it was produced, it becomes truly exceptional. According to an extensive report submitted to the head of the Political Department of Karlag (MVD) (GAKO NTD, F. 26, Op. 3–1, D. 353a, L. 255–260), as well as a subsequent retrospective report by Director P. S. Drozdovskii (GAKO NTD, F. 26, Op. 3–1, D. 353a, L. 166–170), the station's achievements may be summarised as follows.

In the field of plant breeding. Over twenty years of activity (1931–1951), the SKHOS developed a total of 92 new varieties of field, vegetable, fruit, and fodder crops. Of these, 16 varieties of cereals, grasses, and vegetables were zoned by the State Commission for Variety Testing of the Ministry of Agriculture of the USSR for cultivation in multiple regions of the Soviet Union. The 'Dolinskie' millet varieties (Dolinskoe 086, 012, 155, 3151, among others) had, by the late 1940s, been zoned in 20 oblasts, kraia, and autonomous republics of the USSR, including nine oblasts of the RSFSR, six oblasts of the Kazakh SSR, Altai Krai, and three autonomous republics. The winter rye variety Dolinskaia was zoned in Primorskii Krai and five regions of Kazakhstan; the winter wheat variety Alabasskaia in Altai Krai, Omsk and Novosibirsk oblasts, and six regions of Kazakhstan; and the spring wheat variety Karagandinskaia in the Karaganda region.

In the field of elite seed production. Between 1938 and 1950, the SKhOS consistently fulfilled and exceeded state contracts for the supply of elite seeds to district seed farms in the Karaganda and Akmolinsk regions, delivering a total of more than 37,837 centners of elite seed of cereals and oil crops over this twelve-year period, with an average fulfilment rate of 110%. In 1944 alone, the station supplied the state with 3,614 centners of high-quality elite seed (GAKO NTD, F. 26, Op. 3–1, D. 353a, L. 169, 256).

In the field of horticulture. The SKhOS established the first orchards in Central Kazakhstan. By 1950, the station's nursery had provided planting material for nearly all orchards in the Karaganda region, covering a total area of 1,500 hectares. In that year alone, the station supplied collective and state farms with 100,000 saplings of pome and stone fruit species (GAKO NTD, F. 26, Op. 3–1, D. 353a, L. 170). The

station's experimental orchard, described in a scientific report by Director N. M. Rusanov (1952) (GAKO NTD, F. 26, Op. 3–1, D. 466, L. 59–65), expanded to 132 hectares and tested 522 varieties of fruit and berry crops drawn from across the Soviet Union.

In the field of agronomy. The station developed and published comprehensive agronomic manuals adapted to local conditions – *Agrotechnics of Field Crops* (1941), *Agrotechnics of Vegetable Crops* (two editions, 1941 and 1943), and *Agrotechnics of Fruit and Berry Crops* (1943; second edition 1948)–which, according to the station's own assessment, became 'the principal and, indeed, the only manuals available to agricultural workers not only in the Karaganda region but also in other regions of Kazakhstan' (GAKO NTD, F. 26, Op. 3–1, D. 353a, L. 258).

In the field of scientific publications. Researchers at the SKhOS published approximately 200 scientific and popular–scientific articles in specialised journals (*Doklady Akademii Nauk SSSR*, *Vestnik Akademii Nauk Kazakhskoi SSR*, *Agrobiologiya*, *Selektsiia i semenovodstvo*, *Sovetskaia agronomiia*, *Pochvovedenie*, *Mikrobiologiya*) and in the regional press, and delivered more than 80 papers and presentations at all–Union and republican congresses, conferences, and meetings devoted to agricultural issues. Three volumes of the station's own Proceedings were published. At the All–Union Agricultural Exhibition of 1939, the SKhOS was awarded a First–Degree Diploma and a prize of 10,000 roubles, as well as a passenger automobile (GAKO NTD, F. 26, Op. 3–1, D. 353a, L. 144–145, 170).

5. Constraints and Limiting Factors.

The scientific achievements of the SKhOS were attained under conditions of profound structural constraint. On the basis of archival materials, four principal categories of limiting factors may be identified.

Regime–imposed restrictions. The most fundamental constraint was the legal status of the majority of the station's scientific personnel as prisoners. Their research was conducted under the supervision of the NKVD–MVD, and the dissemination of results was strictly controlled. An internal report by Arkhangel'skii notes that the second and third issues of the Proceedings were 'prohibited from distribution' by the Agricultural Department of the Gulag—a decision that the station repeatedly petitioned to have reconsidered in light of the resolutions of the February Plenum of the Central Committee, which called for the rapid implementation of agricultural scientific achievements in production (GAKO NTD, F. 26, Op. 3–1, D. 353a, L. 260). Prisoner–scientists lacked independent access to correspondence, were unable to participate freely in scientific conferences, and depended on the discretion of camp authorities for any external professional contact.

Resource scarcity. The station suffered chronically from a shortage of equipment. By the mid-1940s, it lacked basic agricultural machinery necessary for precise experimental work, including precision seed drills, cultivators, and irrigation systems. Laboratories received no new equipment or reagents throughout the war years, which precluded many essential analyses and delayed breeding work aimed at improving

grain quality. The station possessed only four tractors (two STZ–NATI tracked tractors and two wheeled STZ tractors acquired in 1938) and two Kommunar combine harvesters–aging equipment with inadequate maintenance. Its single motor vehicle had been assembled from spare parts of decommissioned camp machinery (GAKO NTD, F. 26, Op. 3–1, D. 353a, L. 68–69, 259–260).

Financial subordination. The research activities of the SKhOS were financed not by the Ministry of Agriculture but by the Karaganda state farm–effectively the Karlag administration–despite the fact that the station’s outputs served not only the camp but also the collective and state farm sector across several regions. This arrangement produced chronic budgetary imbalance. From 1947 onwards, the Ministry of Agriculture ceased allocating capital investment funds to the SKHOS, while the station’s operational costs for elite seed production increasingly exceeded the procurement prices set by Zagotsortzerno. By 1950, the station required a state subsidy of 773,500 roubles to cover the gap between production costs and procurement prices–almost double the 419,000 roubles received in 1945. This imbalance is documented in official correspondence between the camp commandant, Colonel Maevskii, and the head of the Variety Administration of the Ministry of Agriculture of the USSR (GAKO NTD, F. 26, Op. 3–1, D. 353a, L. 107–109).

Natural and climatic factors. The harsh conditions of the Central Kazakh semi–desert imposed constraints that no institutional effort could overcome in the short term. The brevity of the frost–free period (with late spring frosts possible until 12 June and early autumn frosts from late August), low annual precipitation (198 mm), deep soil freezing (up to two metres), and the intensity of summer dust storms and winter blizzards meant that entire experimental crops could be destroyed. Years such as 1949–described in station reports as a ‘dry and unfavourable summer’–tested the limits even of the most carefully developed agronomic systems. Nevertheless, the SKHOS achieved yields of 13.8 centners per hectare of cereals against a planned 11.5, 349 centners of vegetables against a planned 283, and 221 centners of potatoes against a planned 130 (GAKO NTD, F. 26, Op. 3–1, D. 353a, L. 37–38).

The human factor. In addition to the legal constraints of camp life, prisoner–scientists endured severe physical conditions: overcrowded barracks with only 1–1.8 square metres per person, inadequate nutrition, endemic diseases (including dysentery, pellagra, typhus, and tuberculosis), and exhausting labour norms applied to them on an equal basis with other prisoners (Abdrakhmanova, 2013, p. 61). The death of B. K. Fortunatov from brucellosis in 1940 is well documented; other instances of mortality and deteriorating health among scientific personnel, although not systematically recorded in the examined archival sources, can be readily inferred from the general conditions of confinement.

6. The SKHOS in Historical Context: From Camp Institution to Regional Science.

The trajectory of the SKHOS illustrates a dynamic that is paradoxical in nature yet historically consistent: an institution created to serve the repressive needs of a

forced labour camp evolved, over two decades, into one of the most productive centres of agricultural research in Kazakhstan. By the early 1950s, the station was explicitly commended in a resolution of the Council of Ministers of the Kazakh SSR dated 3 January 1950 for its ‘substantial achievements in the scientific investigation of issues related to the agricultural development of the dry steppes and semi–desert regions of Central Kazakhstan’ (GAKO NTD, F. 26, Op. 3–1, D. 353a, L. 90).

The institutional trajectory of SKhOS exposes a profound contradiction within Soviet agrarian policy: an institution entrusted with tasks of national significance – the implementation of the Dokuchaev–Williams agronomic system, protective afforestation, and the supply of planting stock to entire oblasts – at the same time remained a structural subdivision of the Ministry of Internal Affairs (MVD), was administered by officers, and depended on the labour of prisoners. The liquidation of Karlag in the mid–1950s and the transformation of the station into the Karaganda Research Institute of Crop Production and Breeding resolved this contradiction not through acknowledgement, but through absorption: the scientific legacy produced under conditions of coercion was quietly incorporated into the mainstream of Soviet and Kazakhstani agronomy, without any inventory of its camp origins.

The record-keeping correspondence of SKhOS for 1949–1952 shows that, despite its subordination to the camp system, the station was organically integrated into the all-Union network of scientific and seed-production exchange. Its results were in steady demand among institutions of various levels throughout the USSR. The Ukrainian Research Institute of Crop Production, Breeding and Genetics requested that the station send spring wheat samples of 100–200 grams to replenish its collection material (GAKO NTD, F. 26, Op. 3–1, D. 423b, Book 3, L. 3), while the Moscow State Seed Station requested seed material for supply purposes and distribution to collective farms (GAKO NTD, F. 26, Op. 3–1, D. 423b, Book 3, L. 1). The very fact of systematic correspondence – thirty–eight folios of requests and replies over three years – indicates that interest in the breeding achievements of SKhOS was not episodic, but regular, and extended across institutions from Ukraine to Kazakhstan. Thus, the scientific authority of the station developed independently of its legal status as a subdivision of Karlag, which predetermined the relatively smooth incorporation of its legacy into the mainstream of Soviet agronomy after the liquidation of the camp in the mid–1950s.

The Karlag system was officially abolished in 1959–1960. In the 1960s–1980s, the former camp divisions and the Agricultural Experimental Station (SKhOS) were transferred to the jurisdiction of civilian ministries of the USSR and developed as ordinary large specialised state farms and research institutes of the Kazakh SSR. Former Karlag camp sites and divisions became independent state farms – for example, ‘Gigant’ and the state farm named after the 50th Anniversary of the USSR – which supplied food to the Karaganda coal basin. SKhOS continued its work as a major scientific institution. Its agronomists and breeders introduced advanced technologies of irrigation, agroforestry reclamation, and acclimatisation under the sharply continental climatic conditions of Central Kazakhstan.

At present, Karaganda SKhOS LLP bears the name of A. F. Khristenko – an agronomist and scientist, an innovator in agricultural production, and one of the youngest state-farm directors in the USSR. Its principal activities are the cultivation of grain and leguminous crops, including seed production, as well as the conduct of scientific research and experimental development in the field of biotechnology.

Conclusions.

The present study has shown that the Karaganda Agricultural Experimental Station of Karlag functioned in the 1930s-1950s as a genuine scientific institution of regional significance, with certain results gaining interregional and all-Union recognition, despite its origins within one of the largest Soviet forced-labour camps.

The scientific contribution of SKhOS rested on the intellectual labour of prisoner-scientists – V. S. Pustovoi, S. A. Arkhangel'skii, A. A. Kornilov, P. A. Verteletskii, A. V. Lanina, Ia. E. Vasil'tsev, and B. K. Fortunatov. The archival texts of their works demonstrate a level of theoretical rigour that refutes any characterisation of Karlag science as purely pragmatic.

The achievements of SKhOS were secured despite structural obstacles: the camp regime, shortages of resources, financial dependence on the MVD, and severe natural conditions. The death of B. K. Fortunatov from brucellosis, the prohibition on distributing the station's 'Transactions', and many years of underfunding all give concrete meaning to the concept of 'repressed science' in the Kazakhstani context.

From the perspective of the historiography of Soviet science, the findings of this study require adjustments to both dominant interpretative models. The concept of the 'deformation' of Soviet science under ideological pressure is valid with regard to official scientific centres; however, the materials of SKhOS demonstrate that camp science developed according to a different logic. Karlag's remoteness from Moscow's ideological centres evidently created a certain space for scientific independence, as indicated by Kornilov's willingness to challenge Razumov's thesis precisely at the height of the Lysenkoist offensive.

This space may be defined as limited, or conditional, autonomy. It was not freedom in the academic sense: prisoner-scientists did not control their own mobility, correspondence, or publications. Nevertheless, within a particular experiment or breeding programme, they were able to preserve elements of professional rationality. The emergence of such autonomy can be explained by the practical verifiability of agrarian science – a variety either produced a yield or it did not – by the dependence of the camp economy on expertise, and by the professional identity of the scientists themselves. Departmental supervision controlled the scientist as a prisoner, but it could not always control the scientific procedure itself at the level of agronomic or physiological competence.

Thus, the article's principal historiographical contribution is as follows: it demonstrates not merely the presence of scientists in Karlag, nor simply a list of their achievements, but the institutional mechanism through which repressed expert knowledge was transformed into a resource for Soviet agrarian modernisation. SKhOS

was an institution in which forced labour and scientific achievement coexisted not by accident, but as part of a state design that required the very expertise it had itself placed under detention. A promising direction for further research is the specialised study of the surviving issues of ‘Transactions of the Karaganda Agricultural Experimental Station’ and the search for copies of these publications in the holdings of the museum in Dolinka.

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Conflicts of Interest.

The authors declare no conflict of interest.

References

- Abdrakhmanova, K. K. (2013). Nauchno-issledovatel'skaia deiatel'nost' uchenykh-zakliuchennykh KarLAG [Research activity of prisoner-scientists of KarLAG]. *Gumanitarnye nauki v Sibiri*, (2), 61–64 [in Russian].
- Abdrakhmanova, K. K. (2020). The scientific and creative intelligentsia of Karlag: a historiographical perspective. *Bulletin of Karaganda University. History. Philosophy series*, 97(1), 7–18. Retrieved from <https://history-philosophy-vestnik.buketov.edu.kz/history-philosophy-vestnik/article/view/161> [in Russian].
- Alexopoulos, G. (2017). *Illness and inhumanity in Stalin's Gulag*. New Haven, CT: Yale University Press.
- Arendt, H. (1996). *Istoki totalitarizma [The origins of totalitarianism]* (I. V. Borisova et al., Trans.). Moscow: TsentrKom [in Russian].
- Barnes, S. A. (2011). *Death and redemption: The Gulag and the shaping of Soviet society*. Princeton, NJ: Princeton University Press.
- Berg, A. (1989, April 27). Ostrov v stepi [Island in the steppe]. *Industrial'naia Karaganda – Industrial Karaganda* [in Russian].
- Bzhezinskii, Z. (1990). Bol'shoi proval [The grand failure]. In *Kvintessemsiia: Filosofskii al'manakh – Quintessence: Philosophical Almanac*. Moscow: Politizdat [in Russian].
- Dik, V. (1990). *Karlag: istoriia sudeb [Karlag: a history of fates]*. Alma-Ata [in Russian].
- Dilmanov, S. (2001). Trudovoe ispol'zovanie zakliuchennykh v stalinskikh lageriakh [The labour utilisation of prisoners in Stalinist camps]. *Vysshaia shkola Kazakhstana – Higher School of Kazakhstan*, (2), 176–191 [in Russian].

- Gregory, P. R., & Lazarev, V. (Eds.). (2003). *The economics of forced labor: The Soviet Gulag*. Stanford, CA: Hoover Institution Press.
- Iaroshevskii, M. G. (1991). *Repressirovannaia nauka [Repressed science]*. Leningrad: Nauka [in Russian].
- Joravsky, D. (1970). *The Lysenko affair*. Chicago, IL: University of Chicago Press.
- Kojevnikov, A. (2004). *Stalin's great science: The times and adventures of Soviet physicists*. London: Imperial College Press.
- Kokurin, A. I., & Petrov, N. V. (Comps.). (2000). *GULAG 1918–1960* (A.N. Iakovlev, Ed.). Moscow: MFD [in Russian].
- Krementsov, N. (1997). *Stalinist science*. Princeton, NJ: Princeton University Press.
- Kuznetsova, E. B. (2013). *KarLAG: prostranstvo i sud'by [Karlag: space and destinies]*. Karaganda: Tengri LTD [in Russian].
- Markova, E. V., Volkov, V. A., Rodnyi, A. N., & Iasnyi, V. K. (1998). Uchenye-uzniki Pechorskikh lagerei GULAGa [Scholar-prisoners of the Pechora Gulag camps]. *Novaia i Noveishaia Istoriia – Modern and Contemporary History*, (1), 19–31 [in Russian].
- Markova, E. V., Volkov, V. A., Rodnyi, A. N., & Iasnyi, V. K. (1999). Sud'by intelligentsii v Vorkutinskikh lageriakh [The fate of the intelligentsia in the Vorkuta camps]. *Novaia i Noveishaia Istoriia – Modern and Contemporary History*, (5), 52–64 [in Russian].
- Mogil'nitskii, V. M. (2001). *Zvezdy GULAGa [Stars of the Gulag]*. Karaganda: OJSC "Karaganda Printing". Retrieved from https://csmb.kz/images/csmbkz/ocyfrovannye/Valeriy_Mogilnitskiy_Zvezdi_Gulaga.pdf [in Russian].
- Pankov, V. B. (Ed.). (2019). *Ottsovskaiia pamiat': k 110-letiiu I. K. Fortunatova [A father's memory: on the 110th anniversary of I. K. Fortunatov]*. Moscow: Sergiev Posad, V. B. Pankov and the Orthodox parish of Demetrius-Thessalonica Church in Yakovlevo. Retrieved from https://imwerden.de/pdf/ottsovskaya_pamyat_2019_ocr.pdf [in Russian].
- Pollock, E. (2006). *Stalin and the Soviet science wars*. Princeton, NJ: Princeton University Press.
- Razgon, L. E. (1994). *Plen v svoiom otechestve [Imprisoned in one's own country]*. Moscow: Book Garden. Retrieved from https://imwerden.de/pdf/razgon_plen_v_svoem_otechestve_1994_ocr.pdf [in Russian].
- Roll-Hansen, N. (2005). *The Lysenko effect: The politics of science*. Amherst, NY: Humanity Books.
- Shaimukhanov, D. A., & Shaimukhanova, S. D. (1997). *Karlag*. Karaganda: Industrial Karaganda [in Russian].
- Siddiqi, A. (2017). *The red rockets' glare: Spaceflight and the Soviet imagination*. Cambridge: Cambridge University Press.
- Smirnov, M. B. (1998). *Sistema ispravitel'no-trudovykh lagerei v SSSR, 1923–1960 [The system of corrective labour camps in the USSR, 1923–1960]*. Moscow:

- Memorial Society [in Russian].
- Solzhenitsyn, A. I. (1989). *Arhipelag GULAG: Opyt khudozhestvennogo issledovaniia. 1918–1956 [The Gulag Archipelago: An experiment in literary investigation, 1918–1956]* (Vols. 1–3). Moscow: Sovetskii pisatel'; Novyi mir [in Russian].
- State Archive of the Karaganda Region for Scientific and Technical Documentation (GAKO NTD). (n.d.). *Fond 26, Opis' 3–1, Delo 90* [Archival document, in Russian].
- State Archive of the Karaganda Region for Scientific and Technical Documentation (GAKO NTD). (1939). *Fond 26, Opis' 3–1, Delo 227: Work plan for 1939 on the development of fine-wool fat-tailed sheep* [Archival document, in Russian].
- State Archive of the Karaganda Region for Scientific and Technical Documentation (GAKO NTD). (1940–1942). *Fond 26, Opis' 3–1, Delo 277: Articles for periodical publications* [Archival document, in Russian].
- State Archive of the Karaganda Region for Scientific and Technical Documentation (GAKO NTD). (n.d.). *Fond 26, Opis' 3–1, Delo 287* [Archival document, in Russian].
- State Archive of the Karaganda Region for Scientific and Technical Documentation (GAKO NTD). (1943–1957). *Fond 26, Opis' 3–1, Delo 353a: Documents on the activities of the Karaganda Agricultural Experimental Station (SKHOS)* [Archival document, in Russian].
- State Archive of the Karaganda Region for Scientific and Technical Documentation (GAKO NTD). (1946). *Fond 26, Opis' 3–1, Delo 392: Transactions of the Karaganda Agricultural Experimental Station (SKHOS), Issue 2* [Archival document, in Russian].
- State Archive of the Karaganda Region for Scientific and Technical Documentation (GAKO NTD). (1946). *Fond 26, Opis' 3–1, Delo 393: Transactions of the Karaganda Agricultural Experimental Station (SKHOS), Issue 3* [Archival document, in Russian].
- State Archive of the Karaganda Region for Scientific and Technical Documentation (GAKO NTD). (1949–1952). *Fond 26, Opis' 3–1, Delo 423b: Telegrams and letters on the distribution of spring wheat seed* [Archival document, in Russian].
- State Archive of the Karaganda Region for Scientific and Technical Documentation (GAKO NTD). (1951–1952). *Fond 26, Opis' 3–1, Delo 466: Scientific reports* [Archival document, in Russian].

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Наука в умовах репресій та аграрний розвиток: внесок учених-в'язнів Карлагу в розвиток радянської аграрної науки (1930–1950-ті роки)

Анотація. У статті досліджується Карагандинська сільськогосподарська дослідна станція (СГДС) Карагандинського виправно-трудового табору (Карлагу) як наукова установа, що функціонувала в системі радянського ГУЛАГу в Центральному Казахстані у 1930–1950-х роках. Незважаючи на своє походження в умовах системи примусової праці, станція зробила вагомий внесок у розвиток радянської аграрної науки. Дослідження ґрунтується на первинних архівних матеріалах Державного архіву Карагандинської області з науково-технічної документації (ГАКО НТД, фонд 26), перевірених шляхом зіставлення з опублікованими збірниками документів ГУЛАГу та мемуарними джерелами. У роботі застосовано методи інституційної історії, просопографічного аналізу та контент-аналізу архівних наукових текстів. У статті реконструйовано організаційну структуру СГДС, яка включала шість наукових відділів і штат із дев'яносто восьми працівників, з яких близько 64 % становили ув'язнені. Подано детальний аналіз наукового внеску семи ідентифікованих учених-в'язнів: В. С. Пустовойта, який створив високоврожайні сорти жита та проса, що дозволили утричі підвищити польову врожайність; С. А. Архангельського, чия програма селекції овочевих культур забезпечила виведення районованих сортів, зокрема сорту томатів, зареєстрованого у тринадцяти областях Казахської РСР; А. А. Корнілова, чії експерименти з фотоперіодизмом гібридів ярої пшениці та безперервним освітленням проса поставили під сумнів усталені уявлення радянської фізіології рослин; П. А. Вертелецького, який створив посухостійкий сорт ярої пшениці «Карагандинська», визнаний регіональним стандартом і висіяний до 1949 року на площі понад 7000 гектарів; А. В. Ланіної, чия робота у сфері тваринництва сприяла створенню казахської білоголової породи великої рогатої худоби, відзначеної Сталінською премією у 1940 році; Я. Є. Васильцева, який організував систематичну кампанію боротьби із сапом серед табунного поголів'я коней табору; а також Б. К. Фортунатова, чия програма селекції тонкорунних курдючних овець була перервана його смертю від бруцельозу у 1940 році. Упродовж двох десятиліть СГДС зареєструвала дев'яносто два нові сорти сільськогосподарських культур, шістнадцять із яких були схвалені Державною комісією з сортовипробування для вирощування в кількох регіонах СРСР. Станція також забезпечила районні насінницькі господарства понад 37837 центнерами елітного зернового насіння. У статті стверджується, що СГДС являла собою специфічний режим виробництва знань – примусову експертну науку, у межах якої репресивний інституційний контроль, практичні потреби аграрного сектору та професійна культура

вчених-в'язнів формували суперечливий, але вимірюваний науковий результат. Поступове включення станції до загального руслу радянської та казахстанської агрономії після ліквідації Карлагу в середині 1950-х років інтерпретується як маловідомий процес передачі наукової спадщини, створеної в умовах державного примусу. Перспективним напрямом подальших досліджень є спеціалізоване вивчення збережених випусків «Праць Карагандинської сільськогосподарської дослідної станції» та фондів музею в селищі Долинка.

Ключові слова: наука ГУЛАГу; примусове виробництво знань; експертне знання в умовах примусу; табірна економіка; Центральний Казахстан; біологія сталінської доби

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