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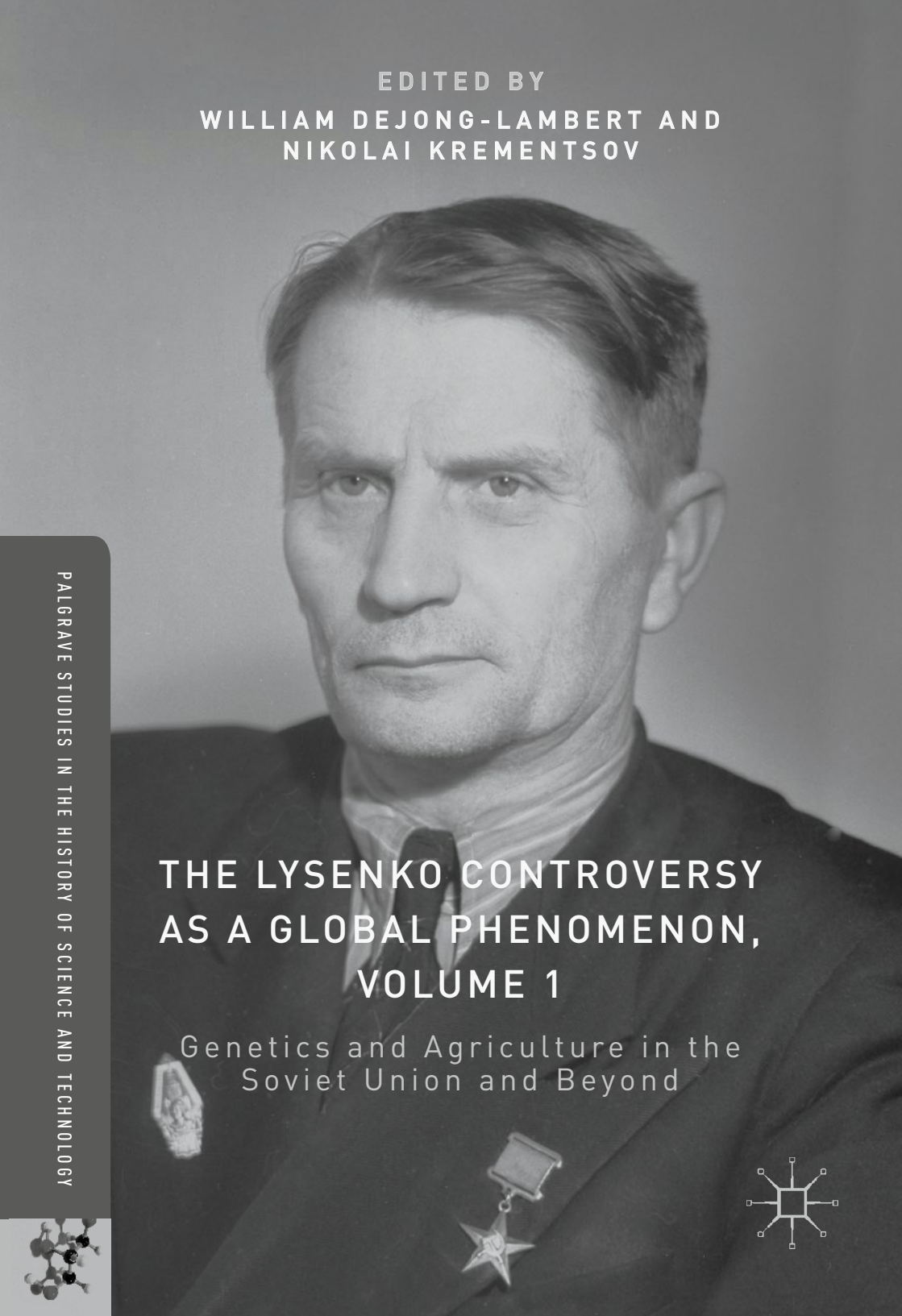

THE LYSENKO CONTROVERSY AS A GLOBAL PHENOMENON, VOLUME 1

Genetics and Agriculture in the Soviet Union and Beyond

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William deJong-Lambert • Nikolai Krementsov
Editors

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Preface, vol. 1

In volume one of *Lysenkoism as a Global Phenomenon* we focus on events in the Soviet Union, chronicling Trofim Lysenko's precursors, rise to prominence, and scientific and cultural influence. The general introduction outlines the history, historiography, and future direction for studies on the Lysenko controversy as a global phenomenon. The first chapter, "Lysenko's Predecessors: the Demichinskiis and a New Technique of Cereals Cultivation," describes Nikolai Alexandrovich and Boris Nikolaevich Demchinsii's development of a new technique of cereal production, similar to Lysenko's later innovation, vernalization. The author asks why the Demichinskii's "panacea" for Russia's perennial food shortages was rejected while Lysenko's was adopted, to show the role of the scientific community in promoting Lysenko's career.

This line of inquiry extends into the next chapter, "State Officials and Would-Be Scientists: How the Ukrainian Ministry of Agriculture Discovered for Lysenko that He Had Made a Scientific Discovery," where the author challenges the conventional wisdom that Soviet press played an important role in Lysenko's celebrity and success. Rather, the press was simply reiterating the views of officials at the Ukrainian Ministry of Agriculture, who had their own motives for favoring Lysenko.

The next chapter, "Pavel Pantelimonovich Luk'ianenko and the Origins of the Soviet Green Revolution," describes Luk'ianenko's success in developing high-yielding semi-dwarf wheat. That Luk'ianenko was able to conduct his research, even while Lysenko was in power, is evidence that Lysenko's anti-genetics campaign was not quite as extensive or comprehensive as previously understood.

The last chapter in this volume, "Lysenko's 'Michurinism' and Art at the Moscow Darwin Museum, 1930s–1950s," chronicles how Lysenko's influence was reflected in the exhibits of the Natural History Museum of Moscow. In this reading, Lysenko's Michurinism provided a resource for survival and access to state resources. Read along with the chapters described above, we gain a more nuanced understanding of Lysenko's impact and career in his homeland. The next volume describes how this influence spread and manifested in variety of nations on both sides of Iron Curtain while he was in power.

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Notes on Contributors

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Societies and others, as well as chapters in edited collections published by Amsterdam University Press, Routledge and Neriton. His research has been funded by the National Science Foundation, Fulbright, the American Council for Learned Societies, the American Philosophical Society and other organizations.

Lukas Joos has completed his MA at the University of Zurich in 2012. He is currently working on preparing for publication his thesis on "The rise of T. D. Lysenko to the presidency of VASKhNIL in light of its coverage in the newspaper *Pravda*."

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Hirofumi Saito has a PhD (2008) from the Tokyo Institute of Technology (Tokyo Tech). From 2009, he has been working as a research associate at the Tokyo Tech, focusing on the history of Soviet genetics. Since 2010, he has been investigating documents of the Archive of the Russian Academy of Sciences. Recently, he published two works, which reconsider the process of Lysenko's intervention into the Institute of Genetics in the late 1930s and Lysenko's personal state in his agrobiology school during World War II.

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Mark B. Tauger is an Associate Professor of history at West Virginia University. After earlier work in musicology, he completed his PhD at UCLA and conducted research in Russia and Ukraine with support from IREX. He has published extensively on Soviet famines and agriculture, the Bengal famine in India in World War II, world agricultural history, and other areas. His work has won the Eric Wolf Prize of the *Journal of Peasant Studies* and the Rasmussen Prize of the Agricultural History Society.

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"Lysenkoism" Redux: Introduction

Nikolai Krementsov and William deJong-Lambert

Soviet agronomist Trofim Denisovich Lysenko (1898–1976) is one of the most notorious figures in the history of twentieth-century biology. US biologist and writer Stephen Jay Gould has described Lysenko's August 1948 announcement that the Central Committee of the Soviet Communist Party had approved his concepts of heredity and evolution as the "most chilling passage in all the literature of Twentieth Century science."[1] In 2015, many Russian biologists and agricultural scientists will celebrate (and some, judging by certain recent publications,[2] mourn) a "Golden Jubilee": the semi-centennial of the final break of Lysenko's nearly thirty-year-long hold on the development of their fields. Like Darwin's and Mendel's, Lysenko's name has been converted into an "ism," a label denoting fierce debates that surrounded his science and his career for more than half a century. Over the years, this label has been applied to a variety of individuals, ideas, practices, and images, making "Lysenkoism" not merely a shorthand for Lysenko's biological theories,[3]

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but a textbook example of pseudoscience, the infringement of political authorities on academic freedom, and the corrupting influence of ideology on scientific culture.

A bibliography of publications on Lysenko and Lysenkoism would include more than 1000 items, ranging from short notes in daily newspapers to voluminous scholarly tomes. Yet, despite the extensive notoriety, there is still no full-length biography of the man, just a few short entries in various encyclopedias.[4] We know surprisingly little about his parents and siblings, his childhood and youth, his personal life, marriage, and children, his personal friends and tastes (in music, literature, food, arts, etc.), or his personal beliefs and attitudes. But the major events of his public life and the story of his "rise and fall"—the *Lysenko Affair*, in David Joravsky's astute characterization—are well-documented.[5] In contrast, the historiography of writings on Lysenko and Lysenkoism—an analysis of the different ways in which his life and works have been presented and assessed by numerous commentators and scholars—remains largely an uncharted territory. The first part of this chapter will provide a sketch of Lysenko's life story. The second will analyze the major trends in writing on and approaches to that story developed over the past fifty years, since its main protagonist had lost his position of a "tsar" in Soviet biology and agriculture. The final part will outline the issues and questions arising from the history and historiography of "Lysenkoism," which are addressed in the present volumes, as well as possible directions for future studies.

The Lysenko Affair: A History

Trofim Denisovich Lysenko was undeniably a Soviet creature: his career as a scientist and state official was closely tied to major events in the history of his country and its science. Trofim was born on September 17, 1898, to a well-to-do peasant family in a small village in the Poltava region in the south-west of the Russian Empire (today's Ukraine). He attended an entry-level agricultural school in Poltava and would perhaps have become a prosperous farmer in his home village. But the 1917 Bolshevik Revolution created new opportunities for the peasant son. As soon as a civil war that had come on the tails of the Revolution spent its fury, in 1921, Trofim enrolled in "correspondence classes" at the Kiev Agricultural Institute, the leading agricultural school in the region. After graduation in 1925, he was sent as a rank-and-file researcher to a remote agricultural experimental station in Azerbaijan.

Lysenko soon came to head a small unit[6] that was assigned the task of introducing new varieties of beans, which could be sown in the winter and grow in the early spring and thus used as animal feed at the time when no local plants were available. This task prompted the young agronomist to investigate the role of temperature in plant development—the subject that would lead to his most celebrated "discovery" and provide a foundation for much of his subsequent theorizing. By exposing seeds and seedlings to different temperature regimes—a technique that was soon named "vernalization"—Lysenko was able to manipulate the timing of their germination and subsequent development in various agricultural plants. This research led him to formulate a concept of "phasic development," postulating that to be completed, different stages (phases) in the development of plants "require" specific temperatures.[7]

Lysenko's early work on vernalization attracted some notice of the scientific community, the press, and the agricultural officials. But it was a new revolution—Joseph Stalin's "revolution from above"[8]—that propelled Lysenko to the administrative heights of Soviet agricultural science. In the late 1920s, the launching of the ambitious first Five-Year Plan, crash industrialization, the forced collectivization of the peasantry, and extensive militarization (combined with a severe draught in the southern parts of the country) led to a horrific agricultural crisis and widespread famine, which prompted the Soviet government's massive investment in agricultural science. In early 1929, the Lenin All-Union Academy of Agricultural Sciences (VASKhNIL) was established as the center of research on all agricultural subjects and the country's leading plant scientist Nikolai Vavilov appointed as its president. The network of agricultural experimental stations and research institutes throughout the country was greatly expanded, with Vavilov's Institute of Plant Breeding in Leningrad serving as its "general staff."

The shortage of qualified personnel for these new institutions (coupled with a vicious attack on "old bourgeois specialists" opened by the 1928 infamous "Shakhty Trial")[9] boosted Lysenko's advancement up the academic ladder. In the fall of 1929, he was appointed head of a special laboratory created for his studies on vernalization at the newly established Ukrainian Institute of Genetics and [Plant] Breeding in Odessa. Initially, several Soviet plant scientists lent a hand to the growing popularity of Lysenko's ideas. Vavilov, for instance, excitedly reported on Lysenko's work to the VI International Genetics Congress held in Ithaca, in 1932. Vavilov saw in Lysenko's vernalization experiments a useful method that allowed manipulating the flowering of plants from different parts of the

world he had collected during his numerous expeditions and thus made possible their crossings in order to breed new varieties of cultivated plants for Soviet agriculture. But Soviet agricultural officials began to actively promote the use of vernalization not as a laboratory procedure, but as an effective *agricultural technique* to increase the yield in a variety of plants, from beans and wheat to potatoes and cotton, all over the country. They also actively promoted the "discoverer" of this technique. In 1932, Lysenko acquired his own periodical, the *Bulletin of Vernalization*, which became an important channel for disseminating his ideas.[10] Two years later, he became a member of the Ukrainian Academy of Sciences and the "scientific principal" of the Odessa Institute. In 1935, Lysenko was appointed a member of VASKhNIL and a member of the Central Executive Committee, nominally the highest state office. The next year, he became the director of the Odessa Institute.

As Lysenko's institutional powers grew, so too did the scope of his theories. Originally, his concepts of vernalization and "phasic development" dealt exclusively with plant physiology and endeavored to explain the influence of temperature on the development of plants. In 1934, Isaak Prezent, a professional philosopher deeply involved in elaborating a "Marxist" interpretation of Darwinism, joined Lysenko's team.[11] It was Prezent who helped Lysenko devise a broad theoretical doctrine that connected vernalization with questions of heredity and evolution.[12] This doctrine was named "Michurinist biology" after Ivan Michurin (1855–1935), an amateur plant breeder hailed as a "Russian Luther Burbank" and accorded the status of a national hero in the Soviet Union in the early 1930s. Interchangeably, it was also named "Soviet creative Darwinism" to emphasize its connections to "Darwinism" that during the previous decade had been incorporated into the official Soviet ideology, Marxism.

The cornerstone of Michurinist biology was the notion of the "transformation of heredity" under the influence of external conditions. Thus, according to Lysenko, vernalization affected not only the physiology of plants but also their heredity, leading, for instance, to the hereditary change of "winter" varieties into "spring" ones. Ivan Michurin's favorite technique of plant grafting provided Lysenko with another way to "transform" heredity. Lysenko interpreted mutual influences of the scion and the rootstock in plant grafts as "vegetative hybridization" that perpetuated such influences in the heredity of offspring. Lysenko claimed that such vegetative hybrids display hereditary characteristics of both parental plants (species) and transfer them to the progeny in the same way sexual hybrids do.

Michurinist biology then openly contradicted the basic tenets of genetics, including Gregor Mendel's laws, Thomas Morgan's chromosomal theory, and the concept of the gene as a material unit of heredity, and supported the Lamarckian idea of the inheritance of the acquired characteristics. It clearly undermined the genetics-based principles of plant breeding, which underpinned the VASKhNIL vast program of creating new varieties of cultivated plants for Soviet agriculture. Not unexpectedly, it provoked severe criticism by several eminent plant breeders and geneticists. Opened on the pages of newspapers and periodicals, the polemic over Michurinist biology crested in two "public discussions" on "issues of genetics" initiated by Lysenko's opponents alarmed by his growing institutional reach and influence on the country's agricultural research, education, and policy.

The first such discussion took place in December 1936 at a special week-long session of VASKhNIL, marking the beginning of what Russian-American geneticist Theodosius Dobzhansky has fittingly named the *Lysenko Controversy*.[13] Leading geneticists and plant breeders, including Vavilov, Nikolai Kol'tsov, Petr Konstantinov, Petr Lisitsin, Alexander Serebrovskii, and H. J. Muller (at the time a senior geneticist at the USSR Academy of Sciences Institute of Genetics headed by Vavilov), advanced a detailed critique of the main theoretical postulates of Michurinist biology and Lysenko's experimental techniques.[14] In their turn, Lysenko and his disciples from the Odessa Institute launched a broad attack on genetics. Emphasizing the historical links between the development of genetics and eugenics (that had been banned in the Soviet Union in 1930), they employed the politicized discourse of the day to portray genetics as "foreign," "idealistic," "bourgeois," "racist," "fascist," "practically useless," and "anti-Darwinist" "Mendelism-Morganism" in contrast to their own "native," "materialistic," "proletarian," "socialist," "practically important," and "Darwinist" Michurinist biology. Geneticists defended their discipline by demonstrating the materialist character of its main theoretical concepts, such as Mendel's laws and Morgan's chromosomal theory. They also pointed to a broad antiracist and antifascist campaign mounted by leading Soviet and Anglo-American geneticists that was about to culminate in a special panel devoted to the critique of "racist and fascist perversions" of genetics at the forthcoming VII International Genetics Congress in Moscow in August 1937.

In some ways, the discussion helped geneticists fend off Lysenko's attack: VASKhNIL allocated considerable funds for expansion of genetics research. But it certainly undermined genetics and geneticists' authority

among their patrons in the party-state apparatus: Lysenko's critique played an important role in the postponement of the VII International Genetics Congress by the highest party office—the Politburo. It also greatly alarmed the international genetics community, forcing the Congress's withdrawal from Moscow and its relocation to Edinburgh. Furthermore, the discussion failed to put a stop on Lysenko's further rise. In 1938, he was appointed president of VASKhNIL and a deputy head of the country's highest legislative body, the Supreme Soviet. A year later, he also became a member of the USSR Academy of Sciences and a member of its ruling council, the Presidium. Lysenko immediately employed his new administrative positions to promote his allies and supporters to key posts within the system of agricultural and biological institutions. In 1937–1939, Michurinist biology also began to enter textbooks on biology and plant breeding for secondary schools, agricultural colleges, and universities.

In October 1939, a second week-long discussion on "issues of genetics" took place at the Marx-Engels-Lenin Institute in Moscow. Triggered by a letter sent by a group of geneticists to Andrei Zhdanov, one of Stalin's lieutenants and a Secretary of the Central Committee of the Soviet Communist Party, the discussion was "adjudicated" by party philosophers, members of the editorial board of the country's major philosophy journal, *Under the Banner of Marxism*.[15] It was largely a replay of the first discussion, with a few minor changes in the rhetoric employed by both sides, which reflected recent drastic changes in the political situation. The August 1939 Molotov-Ribbentrop pact that had overnight made the Soviet Union a German ally forced Lysenko to drop his characterization of genetics as a "fascist science," while geneticists had to mute their references to the antifascist attitudes of their British and US colleagues. Lysenko and his disciples repeated their stock accusations against genetics as a pernicious "foreign," "idealistic," "bourgeois," "practically useless," and "anti-Darwinist" Mendelism-Morganism.[16] Geneticists, in turn, tried to refute the accusations by demonstrating certain practical achievements of their discipline and its adherence to the principles of Marxism and Darwinism, while repeating their critical assessments of Michurinist biology's experimental practices and theoretical conclusions.[17] The discussion ended in impasse. The party officials rebuked Lysenko for using his administrative powers to undermine the institutional positions of his opponents. But they also endorsed his critique of genetics as impractical and anti-Darwinist.[18]

The next year, the death of Kol'tsov and the arrest by the secret police of Vavilov and several of his coworkers opened the way for Lysenko to capture the last institutional bastions of genetics. He himself assumed the directorship of Vavilov's Institute of Genetics and secured the appointment of his faithful followers to the directorship of Vavilov's Institute of Plant Breeding and Kol'tsov's Institute of Experimental Biology. By the end of 1940, virtually all major centers of research in genetics and plant breeding within the system of VASKhNIL and the Academy of Sciences fell under the administrative control of Lysenko and his closest allies. Only a few laboratories and teaching departments at various universities remained in the hands of his opponents. The Nazi invasion of the Soviet Union in June 1941 plunged the country into World War II and relegated the controversy to the back burner.

As soon as the war ended, however, geneticists launched a broad campaign to restore the institutional basis of their discipline and to undermine Lysenko's influence on research, education, and policymaking in biology and agriculture. World War II profoundly altered every aspect of life in the country, including its science. The wartime scientific advances (such as the development of radar, antibiotics, computing machines, and new synthetic materials, to mention only a few iconic examples) greatly enhanced the authority of science, elevating several scientists, including plant geneticist Anton Zhebrak, to influential positions in the Soviet corridors of power. The Alliance of the Big Three—Great Britain, the Soviet Union, and the USA—restored the connections between the Soviet and Anglo-American scientific communities, which had been severed in the late 1930s. With a long history of close personal relations among its practitioners, in genetics, the revival of international contacts was particularly successful. As one would have expected, geneticists quickly capitalized on these developments. In 1945, Zhebrak initiated an intricate plot within the party-state apparatus and asked his British and US colleagues to open a "second front" against Lysenko.

Since the cancelation of the Moscow meetings of the VII International Genetics Congress in 1937, Western geneticists had observed in alarm Lysenko's growing influence on Soviet genetics and biology. They had followed closely the developing controversy between Lysenko and their Soviet colleagues over the basic principles of their discipline.[19] So when in summer 1945, they learned that their colleagues "personally and *confidentially* ask for support"[20] and that "the Soviet Government at the moment is definitely disposed toward giving considerable weight"[21] to

the opinion of Western scientists, they enthusiastically responded to the request and launched broad critique of Lysenko's theories. As part of this well-coordinated campaign, Western geneticists issued an English translation of Lysenko's 1943 treatise on "Heredity and Its Variability" prepared by Dobzhansky and a thorough book-length analysis of Lysenko's research by British plant scientists.[22] They published more than a dozen of reviews and articles in scientific periodicals. It was within this critical campaign that the label "Lysenkoism" was coined and employed as a shorthand descriptor for Lysenko's doctrine.[23]

The anti-Lysenko publications in Britain and the USA did make a serious impression on the Soviet party-state officials. Soviet geneticists also capitalized on the recent synthesis of genetics and evolutionary theory accomplished by their Western colleagues to undermine Lysenko's claims that genetics was quintessentially "anti-Darwinist" while Michurinist biology exemplified "Soviet creative Darwinism." They prepared Russian translations of the key publications on the synthesis. Geneticists used the "second front" effectively to reverse the discouraging momentum of their prewar struggles with Lysenko and to justify their plans for the institutional expansion of their discipline. Against Lysenko's vocal objections, Nikolai Dubinin (a former student of Kol'tsov's) was elected to the USSR Academy of Sciences membership, and, together with Zhebrak, was working hard to establish a new Institute of Genetics under the academy's auspices.

What Soviet geneticists did not and could not plan for, however, was the Cold War. In the summer of 1947, with the shift of the Soviet Union's foreign policy from collaboration to confrontation with its wartime Allies, the elaborate Anglo-American links that had served Soviet geneticists so well suddenly became a dangerous liability. Lysenko and his allies immediately exploited this shift to discredit genetics' leading spokesmen, particularly Zhebrak and Dubinin,[24] and to stall geneticists' offensive. They also launched a broad press campaign to reaffirm the status of Lysenko's doctrine as "Soviet creative Darwinism." The next summer, with the Cold War reaching a crescendo over the status of divided Germany and its capital, Berlin, Lysenko managed to attract Stalin's personal attention to his struggle with geneticists and to secure the Soviet leader's personal support.

Lysenko's ultimate triumph over his opponents was staged as a "public discussion" at a special session of VASKhNIL, carefully planned and coordinated by the party-state officials, including Stalin himself. On July 31, 1948, Lysenko opened the session with a long speech "On the