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Quiet River, Heavy Waters: Un-Silencing Narratives of Social-Environmental Inequalities in the Cradle of Soviet Plutonium

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QUIET RIVER, HEAVY WATERS: UN-SILENCING NARRATIVES OF SOCIAL-ENVIRONMENTAL INEQUALITIES IN THE CRADLE OF SOVIET PLUTONIUM

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To: Dean John F. Stack, Jr.
Steven J. Green School of International & Public Affairs

This dissertation, written by Rosibel Roman, and entitled Quiet River, Heavy Waters: Un-Silencing Narratives of Social-environmental Inequalities in the Cradle of Soviet Plutonium, having been approved in respect to style and intellectual content, is referred to you for judgment.

We have read this dissertation and recommend that it be approved.

Peter Craumer

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Rebecca Friedman

Gail Hollander, Major Professor

Date of Defense: June 28, 2019

The dissertation of Rosibel Roman is approved.

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Florida International University, 2019

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Meeting the vital need to expand access to literature and bibliographic resources that are not readily available to all graduate students and scholars whose research interests are focused on Russia, Eastern Europe, and Eurasia, the Slavic Reference Service (SRS) and the Russian, East European, and Eurasian Center (REEEC) at the University of Illinois Urbana-Champaign (UIUC), enabled me to deepen my knowledge of Russian language literature and bibliographic resources, in addition to benefiting from the expertise offered by the SRS. Thanks to the Housing and Travel Grant I was awarded in 2016 and 2017, it was possible for me to participate in SRL for both of those summers, allowing me to more usefully prepare for long-term archival research in Russia.

I am indebted and endlessly grateful to each of my dissertation committee members as the guidance and support each of them extended to me made this dissertation possible. My advisor, Dr. Gail Hollander, has continuously and wholeheartedly encouraged and supported my research interests in Russia and environmental justice. As

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I sincerely thank Dr. Rebecca Friedman for introducing me to Dr. Kate Brown, who in turn introduced me to Dr. Julia Khmelevskaya of South Ural State University, who generously opened doors for me to carry out archival research in the city of Chelyabinsk, as I mention below. In addition, Dr. Friedman freely shared her advice regarding Russian language programs, and she encouraged and supported my applications for funding to attend these programs about which I have written above. Furthermore, the two seminars I took with her, Graduate Readings in the History of Modern Russia, and Comparative Temporalities in the Modern World, introduced me to a very thoughtfully curated range of scholarly literature and historiographies relating to Russia and the Soviet Union, some of which I came to highly cherish in its own right, such as the work of Svetlana Boym. On top of this, Dr. Friedman's generosity with her time, practical advice, and the good humor with which she so often met my endless spool of questions and uncertainties always made a difference for my peace of mind.

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society" opened up new horizons in how I understood environmental justice and, in particular, my understanding of nuclear science, technology, and society today.

All of my committee members have made a vital difference to my progress through the letters of recommendation each of them have written, too often on very short notice, in support of my many applications for external funding and other opportunities. I will always be indebted to each of them for this.

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and Dr. Khmelevskaya's boundless humanity. I feel incredibly humbled and fortunate to have ever crossed paths with both of these inspiring scholars.

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ABSTRACT OF THE DISSERTATION

QUIET RIVER, HEAVY WATERS: UN-SILENCING NARRATIVES OF SOCIAL-ENVIRONMENTAL INEQUALITIES IN THE CRADLE OF SOVIET PLUTONIUM

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Professor Gail Hollander, Major Professor

In December 1948, the Soviet Union's first plutonium production facility, Mayak Production Association (PO Mayak), began operation in the Southern Urals region of Russia, at the western edges of Siberia, near the restricted city of Chelyabinsk-40, known in the present day as Ozyorsk. Since then, rural communities located downstream from PO Mayak have experienced health, economic, ecological and social impacts of contamination from high-level radioactive wastes released by the facility into the Techa River and its surrounding ecosystem. My research, drawing from archival research conducted in Russia and the United States, as well as secondary sources in English and Russian, focuses on the history of this contamination as a question of environmental injustice.

Within the field of critical geography and the closely related interdisciplinary body of scholarship broadly known as environmental justice, this study engages with debates regarding the causal factors that contribute to the inequitable and unjust distribution of environmental hazards along lines of social difference. Recognizing that throughout this history, such social-environmental inequalities are conspicuously legible

across space and lines of social difference within Soviet society, I frame this case of environmental injustice within the context of French philosopher Henri Lefebvre's concept of the social production of space, and his deployment of this concept to question the legitimacy of actually existing socialism in the Soviet Union.

Drawing from my analysis of archival materials and secondary sources, I argue that the case of radioactive contamination in the Techa River contradicts the Soviet state's historical claims of social equality as its fundamental raison d'être. As the history of the Techa River's marginalized and sickened communities demonstrates, inequality had been built into social relations in Russia in ways that persisted since the tsarist era, through the Soviet years, and into the post-Soviet present. At the same time, this history illustrates the necessarily globalized nature of the Atomic Age and the Cold War which has entwined geopolitical actors in a relational co-production of (in)secure zones of military-industrial technology and the marginalized communities living and dying in their shadows.

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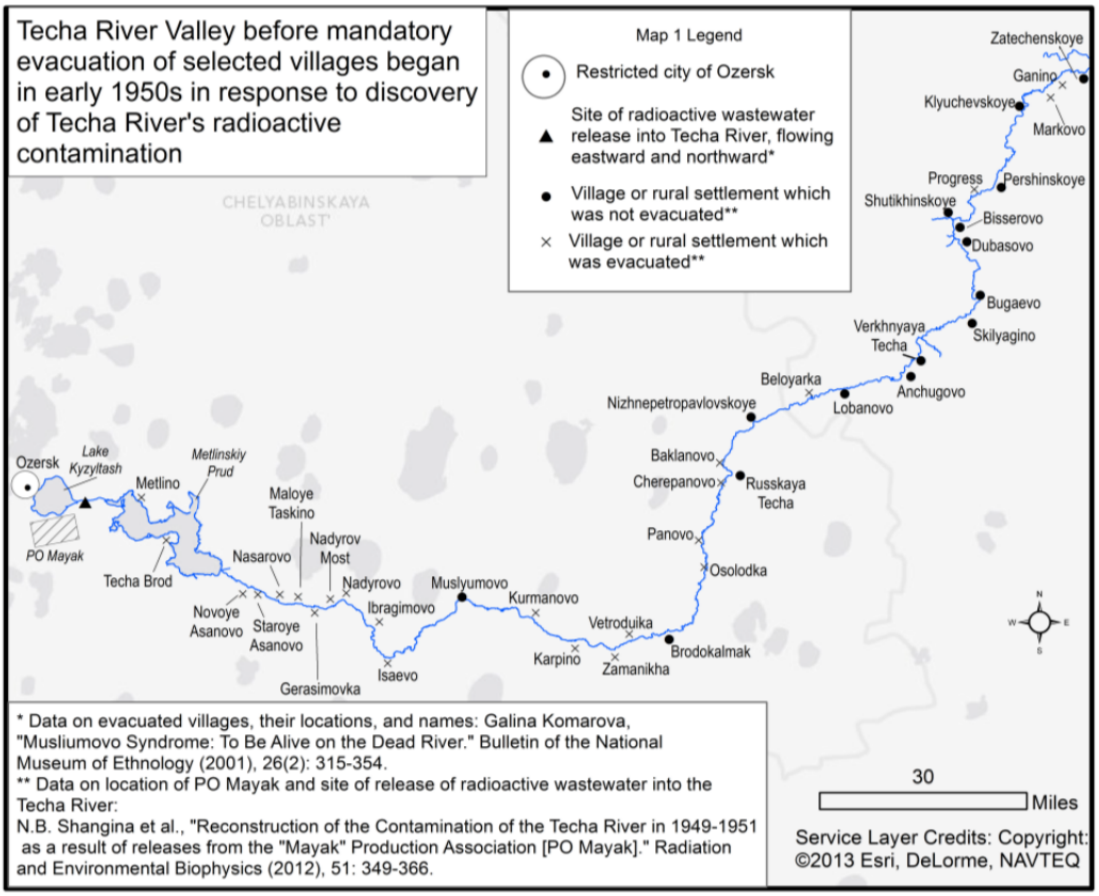
CHAPTER I: INTRODUCTION AND METHODS

In 1948, the Soviet Union's first plutonium production facility, Mayak Production Association (PO Mayak), began operation near the restricted city of Chelyabinsk-40, known as Ozyorsk in the present day. Since then, rural communities located downstream from PO Mayak have continued to experience the health and economic impacts of radioactive contamination released by the facility into the Techa River and the surrounding landscapes.[1] On the one hand, radioactive contamination originating from PO Mayak reached the surrounding population indiscriminately, as a matter of proximity to sources and pathways of exposure. On the other hand, certain segments of the population, particularly in rural areas, suffered greater exposure than other areas as a result of local authorities' and PO Mayak directors' deliberate policies.[2] This research is animated by the recognition of what distinguishes accidental and un-accidental exposure in the case of PO Mayak. Taking these distinctions as my point of departure, my dissertation utilizes archival sources to examine the role of Soviet-era social inequality as a form of structural violence, shaping the environmental burdens of radioactive contamination experienced by communities in the Southern Urals region, particularly

[1] Kate Brown, *Plutopia: Nuclear Families, Atomic Cities, and the Great Soviet and American Plutonium Disasters*. (New York: Oxford University Press, 2013); Galina Komarova, "Musliumovo Syndrome: To be alive on the dead river," *Bulletin of the National Museum of Ethnology*, 26(2): 315-354, 2001; Scott D. Monroe, "Chelyabinsk: the evolution of disaster," *Post-Soviet Geography*. 33(8) 533-545, 1992.

[2] Paula Garb and Galina Komarova, "Victims of 'Friendly Fire' at Russia's Nuclear Weapons Sites" in *Violent Environments*. Nancy Lee Peluso and Michael Watts (eds.). (Ithaca, NY: Cornell University Press, 2001); Galina Komarova, "Ethnic and confessional aspects of the 'Maiak' accident" in *Peoples, Identities, and Regions: Spain, Russia, and the Challenges of the Multi-ethnic State* (Moscow: Institute Ethnology and Anthropology Russian Academy of Sciences, 2015); Michael Edelstein, *Cultures of Contamination: Legacies of Pollution in Russia and the U.S*, Series: *Research in Social Problems and Public Policy*, Volume 14, Michael R. Edelstein, Maria Tysiachniouk, Lyudmila V. Smirnova, eds. (Bingley, UK: Emerald Group Publishing, Ltd., 2007).

during the years from 1945 to 1977.[3] I address primarily how exposure to radioactive contamination, along with the suppression of knowledge about exposure and its lethal risks, articulated with historical social inequalities and structural violence experienced by communities situated in the areas of highest exposure to hazardous risk along the Techa River in Chelaybinsk Oblast.



[3] Brown, *Plutopia*; Garb and Komarova, *Violent Environments*; Edelstein et al., *Cultures of Contamination*.

Critical geography and environmental justice

Within the field of critical geography and the closely related interdisciplinary body of scholarship broadly known as environmental justice, this study engages with debates regarding the causal factors that contribute to the inequitable distribution of environmental hazards along lines of social difference.[4] A major point of contention among scholars is the question of how social differences such as race and socioeconomic status, along with capitalist market dynamics, compare in their respective causal powers to produce inequalities in the spatial and social distribution of environmental goods and hazards.[5] In Soviet society, the official rhetoric opposing capitalism and social inequality renders the social and environmental inequalities that did—and continue to—exist[6] in the north central region of Chelyabinsk Oblast a key case study in which to examine the distinctly Soviet historical production of social and environmental inequalities in a society to which a Revolution against capitalism, against inequality, gave birth. Yet, while environmental justice as an interdisciplinary academic arena of social-

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[4] Robert D. Bullard, *Dumping in Dixie: Race, Class, and Environmental Quality* (Boulder, CO: Westview Press, 2000); Rachel Brahinsky et al., "Race, Space, and Nature: An Introduction and Critique," *Antipode* 46.5 (2014) 1135-1152; Jake Kosek, *Understories: The Political Life of Forests in Northern New Mexico* (Durham, NC: Duke University Press, 2006); David Schlosberg, *Defining Environmental Justice: Theories, Movements, and Nature* (New York: Oxford University Press, 2007.

[5] Bethany Cutts et al., "Media Frames and Shifting Places of Environmental (In)Justice: A Qualitative Historical Geographic Information System Method" *Environmental Justice*, 9.1 (2016) 23-28; Liam Downey, "US Metropolitan-area Variation in Environmental Inequality Outcomes." *Urban Studies* 44:953-977, 2007; Jeremy Pais et al., "Unequal trajectories: racial and class differences in residential exposure to industrial hazard," *Social Forces*, 92.3 (2014) 1189-1215.

[6] Brown, *Plutopia*; Julian Agyeman and Yelena Ognyeva-Himmelberger, *Environmental Justice and Sustainability in the Former Soviet Union* (Cambridge, MA: MIT Press, 2009); Jane Dawson and Robert Darst, "Russia's proposal for a global nuclear waste repository: safe, secure, and environmentally just?" *Environment*, 47.4 (2005) 12-21.

environmental research has become well-established in the United States along with many other regions of the world,[7] there still exists a relative scarcity of scholarly literature concerning the question of social-environmental inequalities in relation to either Soviet or post-Soviet societies.[8]

The social production of space

In relation to the spatial questions of critical geography and environmental justice, the theoretical framework of my research centers on analyzing space itself as a product of society, a concept adopted by critical geographers from the work of the late twentieth century French theorist, Henri Lefebvre.[9] A consideration of social difference and the production of social space in the Techa River Valley requires taking into account the historical contexts in which the social and cultural geography of the Southern Urals formed during the twentieth century. While World War II itself ushered in deep and long-lasting changes in this region, such changes cannot be adequately understood in isolation from tsarist-era disruptions of the steppe and its non-Russian and non-Christian populations. One of the premises of this study, based on the literature relating to the social and cultural geography and history of this region, is that inequality and social difference had been built into social relations in Russia in ways that persisted since its

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[7] David Harvey, *Justice, Nature, and the Geography of Difference* (Malden, MA: Blackwell Publishers Inc., 1996); Elizabeth Ammons and Modhumita Roy, Eds., *Sharing the Earth: An International Environmental Justice Reader* (Atlanta: University of Georgia Press, 2015).

[8] Julian Agyeman and Yelena Ognyeva-Himmelberger, *Environmental Justice and Sustainability in the Former Soviet Union* (Cambridge, MA: MIT Press, 2009).

[9] Henri Lefebvre, *The Production of Space*. Translated by Donald Nicholson-Smith. (Malden, MA: Blackwell Publishing, 1991).

early days as a sovereign state, even as these social inequalities took different forms over time. Whether these inequalities had become so normalized over time that they went unnoticed even by the most earnest revolutionaries or whether they consciously chose to preserve them, the fact remains, as I aim to demonstrate below, that the Revolution did not succeed in the goal of fully undoing the old structures of inequality based on social difference. In this way, it follows that the Soviet production of social space would also maintain old inequalities.

History of Soviet Science

In examining the role of the regime of privileged knowledge, this study also engages with the field of the history of science, focusing on Soviet science in relation to the environment and nature. American and Western European scholars have critiqued Soviet policies and practices towards ecosystems and resources, often portraying the Soviet system as inherently antagonistic towards nature.[10] In more recent years, American and Western European scholars have posed challenges for this model of Soviet human-environment relationships. Their arguments are based on historical research demonstrating critical yet previously overlooked nuances in the histories of Soviet-era science and human-environment relationships.[11] In this way, scholars argue that it is

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[10] Marshall Goldman, *The Spoils of Progress: Environmental Pollution in the Soviet Union,* (Cambridge, MA: MIT Press, 1972); Murray Feshbach and Alfred Friendly, Jr., *Ecocide in the USSR: Health and Nature Under Siege* (New York: Basic Books, 1991); Paul Josephson et al., *An Environmental History of Russia* (New York: Cambridge University Press, 2013).

[11] Jonathan Oldfield and Denis J.B. Shaw, "A Russian Geographical Tradition? The Contested Canon of Russian and Soviet Geography, 1884-1953," *Journal of Historical Geography*, 49 (2015) 75-84; Douglas Weiner, *A Little Corner of Freedom: Russian Nature Protection from Stalin to Gorbachev* (Berkeley:

inaccurate to portray Soviet scientists as monolithic and incapable of self-reflexive critique or to essentialize Soviet human-environment relationships as invariably deleterious.[12] Based on such awareness of tensions and differences among Soviet scientists, I utilize archival sources of key individual scientists' personal documents and official records to illuminate their role in producing knowledge—or, alternately suppressing knowledge—about human health and environmental impacts of plutonium production and how they enabled or challenged the processes by which environmental inequalities were produced.

Reading Privileged Texts

The bulk of the data analyzed for this dissertation consists of archival material from national and regional state affiliated repositories. Rather than regard archival material as self-evident truth, I view the texts as qualitative data which exist by virtue of their privileged position held at the particular place and time when these texts were produced. Understanding that the privileged nature of state bureaucratic documents means that there are narratives and texts missing from the repositories of these documents, my approach to these primary sources has been to not only read them for the existing text, but also that which is missing. At the same time, given that this study directly addresses the Soviet

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University of California Press, 1999); Maria A. Rogacheva, *The Private World of Soviet Scientists from Stalin to Gorbachev*, (New York: Cambridge University Press, 2017).

[12]Denis J.B. Shaw and Jonathan Oldfield, "Scientific, Institutional and Personal Rivalries among Soviet Geographers in the Late Stalin Era," *Europe-Asia Studies*, 60.8 (2008) 1397-1418; Sonja D. Schmid, *Producing Power: The Pre-Chernobyl History of the Soviet Nuclear Industry*, (Cambridge, MA: The MIT Press, 2015); Sergey Glebov, "The Empire of Language: Space and Structuralism in Russian Eurasianism," in *Empire De/Centered: New Spatial Histories of Russia and the Soviet Union*, Sanna Turoma and Maxim Waldstein, eds. Pp: 31-60 (Burlington, VT: Ashgate, 2013).

state and how it articulated and exercised power to impose distinct structures within space and society, documents produced by Soviet state bureaucracies represent a critical source of data. Within the holdings at OGAChO in particular, a key source of data relating to individual scientists, is located within the division of personal documents for individuals whose life work has been recognized as contributing to the region's history.

Archival material housed at a site of state institutional privilege is processed and mediated by archivists who are, first, bound by obligations primarily to the state and its laws, particularly in terms of guarding classified or politically sensitive material, secondly, to the professional practice and theory of producing and maintaining archival material, especially as technology and sheer growth in the volume of material continues to usher in rapid changes, and thirdly, to production of knowledge.[13] Apart from archival material, additional sources of data consist of published material as primary and secondary sources. I place the texts I use as sources of data within the context of their time and place with the intention of keeping their meanings and purposes intact, using what I know about the Soviet state, the governing bodies and hierarchies of government and the Communist Party. Accordingly, I use the historiographies relating to that Soviet period in order frame my interpretation of the texts. In line with my critical approach to the inherent subjectivity of knowledge production, I am conscious of my own value-laden

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[13] Francis X. Blouin and William G. Rosenberg*, Processing the Past: Contesting Authority in History and the Archives* (New York: Oxford University Press, 2011); Kristina Spohr Readman, "Memoranda," in Miriam Dobson and Benjamin Ziemann (eds.), *Reading Primary Sources: The Interpretation of Texts from 19th and 20th Century History* (New York: Routledge, 2009).

questions and analysis interpreting texts in a language, a history, and a place that is far from my own.[14]

Archives

I have collected archival data at the Integrated State Archives of Chelyabinsk Oblast (*Ob'edinennyi Gosudarstvenniy Arkhiv Cheliabinskoi Oblasti*, or OGAChO) in the city of Chelyabinsk, Russia, where I conducted research for four months. This repository houses archival materials and primary sources relevant to the social, cultural, political, and geographical history of Chelyabinsk Oblast. I have also focused on the holdings corresponding to the unpublished works and personal materials for specific Soviet planners, local authorities, geographers and ethnographers who had been active during the period preceding the construction of PO Mayak. Finally, I have closely analyzed these sources with particular attention to how each individual interprets and represents social difference and equality in relation to space. At the Central State Archives of Scientific-Technical Documentation (TSGANTD) in St. Petersburg, a repository of records pertaining to the study of radiation safety as a division of the Institute of Experimental Medicine which are held in Fond R-128. In addressing Soviet scientists' individual subjectivities and their social positions affected their practice of research as well as how the knowledge they produced was applied towards the response to

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[14] Benjamin Ziemann and Miriam Dobson, "Introduction," in Dobson and Ziemann (Eds.), *Reading Primary Sources: The Interpretation of Texts from 19th and 20th Century History* (New York: Routledge, 2009).

radioactive contamination,[15] primary and secondary sources has been guided my search for data to address this question shifts from official discourse to the personal.

Tankograd: a chronotope of total war

In light of the extent to which the aftermath of the World War II--in Russian history and memory, the Great Patriotic War--permeates many aspects of this study, my approach to the Soviet past from 1945 until the late Brezhnev years is situated within a particular spatial and temporal consciousness. I borrow the term "chronotope" - or time-space - from the Russian philosopher and semiotician, Mikhail Bakhtin, to narrate the spatial and temporal impacts of the war as a chronotope of total war.[16] I argue that such a narrative is necessary in order to adequately appreciate the transformations of landscapes, demography, daily living--the production of space--during and after the war. World War II was experienced extremely and viscerally by most Soviet citizens in such a way that cannot be overstated in an analysis of the production of social space during the postwar years.[17] In the case of the Southern Urals, the social and spatial transformations triggered by the war occurred with especially dramatic effect, and they continued to define the

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[15] Denis J.B. Shaw and Jonathan Oldfield, "Totalitarianism and geography: L.S. Berg and the defense of an academic discipline in the age of Stalin." *Political Geography* (2008) 27(96-112).

[16] Mikhail Bakhtin was a twentieth century philosopher and semiotician. He borrowed from Albert Einstein's theory of relativity and his physical concept of "time-space" as fabric of the universe to arrive at his own literary concept of what he termed the "chronotope" (time-space) in the genre of novel writing. To attempt a crude definition, a chronotope refers to the "situatedness" an author needs to create in a novel -- an entirely new world, with its own temporality and spatiality necessarily intertwined and mutually formed, while fitting that world with the categories that actually exist in the author's "real world." Michael Holquist, *Dialogism: Bakhtin and His World* (London: Routledge, 2002). For an example of existing scholarship on Soviet history incorporating the concept of the chronotope: Vieda Skultans, *The Testimony of Lives: Narrative and Memory in Post-Soviet Latvia* (London: Routledge, 1998).

[17] Weiner, *Making Sense of War*.

region long after 1945.[18] The close proximity of mineral resources throughout the Urals and the relative remoteness of the region served as ideal characteristics to further establish this region as a hub of scientific-technical research and military-industrial manufacturing.

During the war, particularly from 1941 through 1943, urgently mobilized evacuations transferred masses of people and machinery eastward, with the aim of protecting key industrial resources and production capacity from Nazi encroachment. Primarily the Urals, Siberia, Kazakhstan, Uzbekistan, and Kyrgyzstan received evacuees and accommodated transplanted factories. The receiving populations and landscapes tended to be logistically overwhelmed by the sudden influx of evacuees and machinery. For perspective, approximately 44 per cent of 1,523 evacuated factories were dismantled and transferred by rail to be reconstructed in the Urals.[19] Evacuations from western regions of the Soviet Union fleeing Nazi encroachment involved seemingly endless and often severely harsh journeys, creating the persistent sense of displacement and interrupted life, often permanently.[20] For populations of regions receiving evacuees such as the Urals, the mass evacuations brought about striking changes in the demography and landscapes. In Chelyabinsk Oblast', for example, the sudden influx of factory workers

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[18] James R. Harris, *The Great Urals: Regionalism and the Evolution of the Soviet System*, (Ithaca, NY: Cornell University Press, 1999).

[19] Sanford R. Lieberman, "The Evacuation of Industry in the Soviet Union during World War II," *Soviet Studies*, 35(1) (Jan. 1983), p. 91; Robert Argenbright, "Space of Survival: The Soviet Evacuation of Industry and Population in 1941," in *Beyond the Limits: The Concept of Space in Russian History and Culture*, ed. Jeremy Smith, *Studia Historia* 62.

[20] Rebecca Manley, "The Perils of Displacement: The Soviet Evacuee between Refugee and Deportee," *Contemporary European History* 16(4) (2007), pp. 495-509.

and materialization of industrial spaces such as military machinery manufacturing centers imposed so prominently on the landscape that its capital city, Chelyabinsk, acquired a second name: "Tankograd."[21]

Rural areas experienced the most dramatic transformations. Demographically, the majority of adult males, with the exception of the elderly and sick, whether voluntarily or not, were shipped westward to combat. On the one hand, this placed a heavier burden of labor on rural women as farms lost approximately 75 percent of the workforce as a result of males drafted to war.[22] Facing a high demand of food supply for the Red Army, in addition to the crowded workforce in urban areas, farms frequently fell short of producing a sufficient surplus to provide for farm workers themselves. Because only urban workers were eligible to receive food ration cards, rural populations often suffered from severe and persistent hunger.[23]

In addition to the mass evacuations, the transport of Gulag prisoners and prisoners of war, a third kind of massive displacement occurred, one which targeted Soviet citizens with German heritage in the lower Volga region. Based on the suspicion of collusion with the Nazi army, Stalin ordered these populations to be forcibly removed from their homes and exiled eastward to forced labor camps in Siberia and Central Asia steppes. The routes

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[21] Lieberman, "The Evacuation of Industry."

[22] William Moskoff, *The Bread of Affliction: The Food Supply in the USSR during World War II*, (New York: Cambridge University Press, 1990); Overy, *Russia's War*.

[23] Overy, *Russia's War*, p. 224.

of exile, as in the case of the evacuations and the transport of Gulag prisoners, often traversed the Southern Urals.[24]

The purpose of discussing such ways in which displacements, interrupted life, the breakneck pace of militarization, and coercive labor articulated into what I am conceptualizing as a chronotope of total war is to demonstrate the complexity of wartime Soviet space and its production, the terrain of social difference, and temporality—in short, the world of living and dying in the Soviet Union during total war. In this sense, I distance my narrative from a common tendency among American and Western European scholars of Russian environmental history to criticize the apparent zeal which characterized Soviet militarization during and after World War II. Such critiques point to the Soviet Union's rampant environmental destruction as evidence of "ecocide." The ecocide narrative, however, elides the reality that had the Soviet Union failed to militarize at a manic pace and scale, it would have fallen to the Nazi regime—a fate it only very narrowly avoided.[25] Considering this hypothetical scenario of a Nazi victory over the Soviet Union, one might ask the hypothetical question: Stalin notwithstanding, how much more environmentally ethical than the Soviets could one have expected the invading Nazi army to be in fulfilling its conquest of *Lebensraum*?

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[24] Vera Tolz, "New Information about the deportation of ethnic groups in the USSR during World War 2," *in World War 2 and the Soviet People*, Carol Garrard and John Garrard (Eds.), for *World Congress for Soviet and Eastern European Studies*, (New York: St. Martin's Press, 1990), pp. 161-165.

[25] Richard Overy, *Russia's War: A History of the Soviet War Effort: 1941 - 1945* (New York: Penguin Books, 1997); Amir Weiner, *Making Sense of War: The Second World War and the Fate of the Bolshevik Revolution* (Princeton: Princeton University Press, 2002).

Turning towards the end of the war, the world saw the first use of nuclear weaponry as one of the final acts, carried out by the United States on hundreds of thousands of human beings, many of whom were civilians, in Hiroshima and Nagasaki on August 6th and 9th, 1945. Given the Soviet experience of the war, still raw and present in memory, the almost accidental circumstances by which it dodged Nazi conquest, and President Truman's demonstration of coolly executed acts of massive annihilation on these two dates, the rationale for fevered militarization emerges into sharper focus as a stance of self-preservation, and less a matter of ecocide for its own sake. The chronotope of total war gave way to a new chronotope - one in which the shell-shocked USSR faced the new and greater threat of nuclear devastation and redefined itself in terms of security above all else.

CHAPTER II: THEORIZING ENVIRONMENTAL JUSTICE AND THE PRODUCTION OF SPACE

Introduction

Environmental justice (EJ) activists and scholars have long recognized the versatility and universal potential of EJ as a field of scholarly research as well as a set of organizing principles by which to mobilize social change.[26] In academic scholarship, EJ articulates with a broad spectrum of disciplines ranging from social science fields such as geography, sociology, urban planning, and law, to biological sciences such as epidemiology and toxicology, to the humanities such as history, literature, and film.[27] The ability for such diverse fields of study to engage with EJ attests to its broad applicability and conceptualizing power to pursue salient questions and concerns across society. Similarly, EJ has generated growing waves of social movements that animate EJ concepts in specific, contingent situations of environmental *in*justice not only within the United States but across the world.[28] In this chapter, I will present an overview of EJ as a field of research and as an organizing banner for social movements, while commenting on its role

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[26] Robert D. Bullard, "Dismantling toxic racism," *The Crisis*, Jul/Aug 2007, 114(4) pp. 22-25; Harvey, *Justice, Nature, and the Geography of Difference*.

[27] For an example of recent scholarly research incorporating environmental justice in film, see: Pavithra Vasudevan, "Performance and Proximity: Revisiting Environmental Justice in Warren County, North Carolina," *Performance Research,* 2012, 17 (4): 18-26, and Vasudevan and William A. Kearney, "Remembering Kearneytown: Race, Place, and Collective Memory in Collaborative Filmmaking," *Area*, 2016, 48(4): 455-462.

[28] For a selection of examples of EJ social movements outside of the U.S.: Ammons and Roy, *Sharing the Earth: An International Environmental Justice Reader*; Richard Filčák, *Living Beyond the Pale: Environmental Justice and the Roma Minority*, (Budapest/New York: Central European University, 2012); Adam Simpson, *Energy, governance and security in Thailand and Myanmar (Burma): a critical approach to environmental politics in the South*, (Copenhagen: NIAS Press, 2017); Dorceta Taylor (Ed.), *Environment and Social Justice: An International Perspective*, (Bingley, UK: 2010).

in the theoretical framework within which I situate the social-environmental inequalities that shape the history and landscape of the Techa River Valley. Following this overview, I will draw connections between EJ and Henri Lefebvre's conceptualization of the production of space, with attention to radioactive contamination in the Techa River Valley. As I incorporate EJ and Lefebvre's ideas within my theoretical approach to social-environmental inequalities in the Techa River Valley, I also involve Marxist critiques of capitalist transformations of social-environmental relationships. Finally, I will discuss rifts between Marx-inspired approaches to knowledge production as conceptualized by Anglophone and Western European theorists working within the frame of Marxist critical theory in recent decades vis-à-vis historical Soviet implementations of Marxist principles.

Overview of environmental justice (EJ)

The first part of this overview of EJ will begin with a short summary of the movement's origins, widely understood as having arisen as part of the Civil Rights Movement in American history, followed by a brief survey of the fundamental premises of EJ research and scholarship.[29] Furthermore, this brief survey will include a short review of selected literature concerning the definition of EJ, which is often conceptualized in terms of distributive justice—specifically the unequal distribution of environmental burdens of toxins placed upon communities composed of primarily racial/ethnic minorities and

[29] Bullard, "Dismantling toxic racism"; Dorceta Taylor, "The rise of the environmental justice paradigm: injustice framing and the social construction of environmental discourses," *American Behavioral Scientist*, 43(4) January 2000, pp. 508-580.

impoverished populations.[30] As part of this short review of EJ literature, I will include other conceptualizations of justice which extend beyond the quantitative measures of environmental burdens as distributed among marginalized communities. These additional conceptualizations of justice are oriented towards addressing the broader sociopolitical processes that produce and reproduce that distribution. Lastly, I will elaborate the concept of *contested knowledges*,[31] another aspect of sociopolitical structures and processes of justice which hold particular relevance for the history of victims of radiation exposure in the Techa River Valley concerning the question of contested knowledges and the power differential separating the knowledge claims of scientific authorities from those of victimized communities.[32]

EJ origins and environmental racism

EJ, as it is known today, arose from the sociopolitical consciousness activated by the Civil Rights Movement, confronting the historically, sociopolitically, and geographically specific conditions that have resulted in systematic oppression of racial/ethnic minorities

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[30] David Schlosberg, *Defining Environmental Justice: Theories, Movements, and Nature*, (New York: Oxford University Press, 2007).

[31] The concept of contested knowledges as I engage with it in this research is not related to the recently published special issue of Water, which focuses on contested knowledges and related frictions among different "regimes of knowledge" in relation to water conflicts. Regarding this timely and critical topic, see: Esha Shah, Rutgerd Boelens and Bert Bruins (Eds.), *Contested Knowledges: Water Conflicts on Large Dams and Mega-Hydraulic Development*, (Basel: MDPI, 2019).

[32] Ibid.; Beck, *Risk Society: Towards a New Modernity*, (London: Sage, 1992); Natalie R. Sampson et al., "Improving public participation to achieve environmental justice: applying lessons from freight's frontline communities," *Environmental Justice*, 7(2) 2014, pp. 45-54.

throughout the history of the United States.[33] Tracing the history of the movement, environmental sociologist Dorceta Taylor points out that the origins of EJ are anchored deep in the history of grassroots activism working against sociospatial manifestations of racial discrimination during the nineteenth century—an era in which the "environment" as a concept had not yet been discursively or consciously linked to civil rights or justice in American politics.[34] Yet, as she argues, the products of structural racism, including substandard housing conditions for enslaved African American populations, deceptive and predatory terms in sharecropping practices and land acquisition, and the institutionalized racial segregation of the built environment as well as recreational "natural" environments such as parks and beaches all fall within the scope of what would be conceptualized as environmental racism in the late twentieth century.[35] In this way, such early activists mobilized against the physical and psychological health burdens borne out of disproportionate exposure to environmental harm as a function of sociospatial patterns of structural racism. Similarly, the pioneer of EJ research, Robert Bullard, has referenced Dr. Martin Luther King, Jr.'s active support of striking sanitation workers in Memphis, Tennessee during the 1960s as another example of EJ activism before it was known as such.[36] Additionally, on the issue of sanitation and municipal

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[33] Robert D. Bullard, "Environmental Justice for all," *The Crisis*, 2003, 110(1): 24-26; Naguib Pellow, *Garbage Wars: the Struggle for Environmental Justice in Chicago*, (Cambridge, MA: MIT Press, 2002); Taylor, "The rise of the environmental justice paradigm."

[34] Taylor, "The rise of the environmental justice paradigm."

[35] Ibid., 534-535.

[36] Bullard, "Environmental Justice for all."

waste services, EJ scholar, David Naguib Pellow, has followed the history of Chicago's municipal waste services into nineteenth century to illuminate social-environmental inequalities experienced by marginalized African American communities overburdened by exposure to toxins from landfills and municipal waste processing centers in the places where they both live and work.[37]

These examples of the mobilization around environmental racism also allowed for important disruptions of how the "environment" itself was understood. One of the early key contributions to the EJ theoretical framework which manifested from coining the term *environmental racism* is that it "transformed the environment into a salient frame in communities of color." [38] In this way, the concept of environmental racism began to pose challenges for environmental discourse that tended to exclude minorities while focusing on the environment as a predominantly non-human realm to which peopled places, such as those of everyday life and livelihoods, were positioned as antagonists.[39] Furthermore, the EJ movement's early 1980s coinage of the term, *environmental racism*, can be understood as part of a larger quest for social change and justice, where the broader sociopolitical and historical processes that have produced environmental injustice also manifest as an insidiously life-threatening form of racism.[40] As Bullard has defined *environmental racism*, it "refers to any policy, practice, or directive that differentially

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[37] Pellow, *Garbage Wars*.

[38] Taylor, "The rise of the environmental justice paradigm," p. 536.

[39] Ibid.; Neil Smith, *Uneven Development: Nature, Capital, and the Production of Space*, (Athens, GA: University of Georgia Press, 2008).

[40] Dorcetta Taylor, *Toxic Communities: Environmental Racism, Industrial Pollution, and Residential Mobility*, (New York: New York University Press, 2014).

affects or disadvantages (whether intended or unintended) individuals, groups, or communities based on race or color. Environmental racism is only one form of environmental discrimination." [41] On this point, EJ scholars emphasize that *environmental racism* and *environmental injustice* are not interchangeable terms; although environmental racism is *a* form of environmental injustice, it refers to a more specific set of circumstances, as noted above.[42] Relatedly, Bullard, along with EJ scholars as a whole, argues for the importance of recognizing within the scope of EJ the institutionalized and inequitable sociospatial relations which also result in the victimization of low-income white populations.[43]

Understanding environmental justice

As Bullard's research began to gain increasingly more currency in the 1990s, sometimes with the effect of being inaccurately interpreted by other scholars, he published a clarifying definition of the term *environmental justice*: "Environmental justice embraces the principle that all people and communities are entitled to equal protection of environmental and public health laws and regulations." [44] Bullard's 1996 definition highlighted the quest for justice as part of the struggle against environmental racism, in addition to emphasizing the inclusive scope of EJ as a social movement and field of

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[41] Robert D. Bullard, "Environmental Justice: It's More Than Waste Facility Siting," *Social Science Quarterly*, 77(3) Sept. 1996, p. 497.

[42] Ibid.; Pellow, *Garbage Wars*; Taylor, "The rise of the environmental justice paradigm."

[43] Ibid.

[44] Bullard, "Environmental Justice," p. 493.

research. Despite Bullard's clarification, an oversimplified interpretation of EJ continued to develop as it was frequently represented as focusing only on a distributive understanding of justice.[45] Such representations relied primarily on simplistic spatial terms analyzing the location and distribution of environmental burdens, e.g. the proximity of minority and low-income neighborhoods to sites that release concentrated toxins.[46] As social and environmental research studies began to increase in number, this limited concept of EJ, focusing on the distribution of environmental "bads" continued to be reproduced.[47] Addressing such misrepresentations of EJ, Bullard has sought to set the record straight, even publishing an open response to one such research paper which inaccurately portrayed both the movement and research field of EJ.[48] On the issue of the thematic predominance of unequal shares of environmental burdens placed upon low-income and racial/ethnic minority populations, along with Bullard's call for "equal protection," it is worth remembering the urgency and alarm Bullard's early research findings rightfully provoked regarding environmental conditions that pose highly dangerous physical and mental health risks, particularly for children, and sharply diminish the quality of life in places where racial/ethnic minorities and low-income

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[45] For one example, see: Tracy Yandle and Dudley Burton, "Reexamining environmental justice: a statistical analysis of historical hazardous waste landfill siting patterns in metropolitan Texas," *Social Science Quarterly*, 77(3) 1996, pp. 477-492, cited in Bullard, "Environmental Justice.")

[46] Gordon Walker, "Beyond distribution and proximity: exploring the multiple spatialities of environmental justice," *Antipode*, 41(4) 2009, pp. 614–636; Schlosberg, *Defining Environmental Justice*.

[47] Schlosberg, *Defining Environmental Justice*.

[48] Bullard, "Environmental Justice." Bullard responds to Yandle and Burton, "Reexamining environmental justice."

populations reside.[49] Under these circumstances, there is justification in the prioritization of focusing EJ's attention to hazardous conditions rather than on the important yet less life-threatening issues of access to environmental amenities or "goods." As a result, the sheer amount of Bullard's findings and publications, substantiated with empirically-based analyses, succeeding in placing into focus the patterned starkness of environmental hazards concentrated at sites where marginalized populations, such as impoverished communities and racial/ethnic minority groups live, work, or attend school. In this sense, it becomes clear that the EJ movement's message was that the broader, more profoundly ingrained social structures and processes that have produced these environmentally harmful conditions needed to change and improve. As political theorist David Schlosberg noted, ever since Bullard's earliest research endeavors on this topic, the social movements with which his work has articulated have long aimed beyond the question of distribution as the only measure of justice, pursuing instead more comprehensive and multi-faceted forms of social change.[50]

In this way, while Schlosberg affirms the centrality of distributive justice, he also argues for incorporating the ideas of theorist Iris Marion Young and her extensive consideration of structural factors, which include participation, recognition, and

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[49] Robert D. Bullard, *Dumping in Dixie: Race, Class, and Environmental Quality*, (Boulder: Westview Press, 1990); Bullard, "Solid Waste Sites and the Black Houston Community," *Sociological Inquiry*, 58(2/3) 1983, 273-288; Bullard, *Unequal Protection: Environmental Justice and Communities of Color*, (San Francisco: Sierra Club Books, 1994). On the shift in public health research towards more directly addressing social and economic concerns in public health research: Paula Braveman and Laura Gottlieb, "The Social Determinants of Health: It's Time to Consider the Causes of the Causes," *Public Health Reports*, 2014, Vol. 129 (Supp. 2), 19-31.

[50] Schlosberg, *Defining Environmental Justice*.

capability of marginalized groups, as key elements of justice with which to more comprehensively address those larger social structures and processes that produce social-environmental inequalities and more effectively direct the political efforts of social movements.[51]

Contested knowledges

Contested knowledges forms one of the key aspects of the EJ framework in which I situate the social-environmental dilemma of radioactive contamination throughout the Techa River Valley. In one sense, it relates to the power embedded in the privilege of knowledge production, the question of whose voice is authorized to produce knowledge, and which knowledges are validated as truth. The sociologist, Ulrich Beck, addressed the problem of power differentials separating scientific knowledge producers from those who merely carry the impact of decisions executed on the basis of the claims of such knowledge producers situated in privileged positions of power, particularly in the context of his theory of the risk society.[52] In the risk society, the particular type of risk Beck refers to is one which is produced as an accidental yet inherent feature of industrialization and capital-intensive, technological advancements that are supposed to distinguish and produce a modernized society.[53] This particular type of risk is also characterized by a great deal of uncertainty, in part because it is so new or dangerous to test that the scientific claims of experts are frequently based on inadequate empirical research, such as

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[51] Iris Marion Young, *Justice and the Politics of Difference*, (Princeton: Princeton University Press, 2011).

[52] Ulrich Beck, *Risk Society: Towards a New Modernity*, (London: Sage, 1992).

[53] Ibid.

the tenuous determination of safe levels of toxicity. Despite such uncertainty on the part of designated experts, their claims generally continue to prevail over the concerns and first-hand accounts of laypersons who have experienced harm from industrial or technological sources.[54] As Beck argues,

> The insistence that connections are not established may look good for a scientist and be praiseworthy in general. When dealing with risks, the contrary is the case for the victims; they multiply the risks….If the recognition of a risk is denied on the basis of an 'unclear' state of information, this means that the necessary counteractions are neglected and the danger grows.[55]

At the same time, Beck anticipated that his theory of the risk society could lead to a slippery slope of relativism and unsubstantiated denials of scientific facts. In order to avoid such potentially dangerous cognitive pitfalls, Beck advocated for a theoretical approach that acknowledges that there exist both socially constructed and empirically verifiable aspects to risk as part of his theorization of the heightened risks created by power differentials between experts' and laypersons' competing knowledge claims.[56]

More directly relating to EJ, the concept of contested knowledges informs recognition and capability as elements of justice relevant to racial/ethnic and class biases and the tendency for scientific experts, especially those in positions of power along with other authority figures, to dismiss the claims of victims, particularly those of rural,

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[54] Ibid.

[55] Ibid., 62.

[56] Ibid.

working class, or otherwise socially marginalized communities, as ignorant.[57] In particular, this tendency characterizes one of the main dilemmas in environmental justice struggles in the U.S.[58] The dismissal of those who are perceived as being uneducated and/or not trustworthy also plays a role when considering the concept of participation as a measure of justice. As numerous researchers of EJ cases have shown, marginalized communities in the U.S. are often deemed too ignorant and indifferent to care about urban planning and zoning decisions regarding their neighborhoods and are therefore provided little if any opportunity to access information and participate in the decision-making processes that will affect them.[59] One of the clearest examples of this in the U.S. relates to the aftermath of Hurricane Katrina and affected populations of New Orleans. Despite toxic contamination pervading neighborhood homes, buildings, outdoor areas, and water, the EPA had deemed these areas safe enough to return to, whereas independent tests proved that they were not.[60] Similar patterns of sociopolitical exclusion have historically left vulnerable communities living in the shadow of the PO Mayak

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[57] Schlosberg, *Defining Environmental Justice*; Sampson et al., "Improving public participation to achieve environmental justice."

[58] Bullard, *Dumping in Dixie*; Robert D. Bullard and Beverly Wright (Eds.), *Race, Place, and Environmental Justice After Hurricane Katrina: Struggles to Reclaim, Rebuild, and Revitalize New Orleans and the Gulf Coast*, (Boulder: Westview Press, 2009); Melissa Checker, *Polluted Promises: Environmental Racism and the Search for Justice in a Southern Town*, (New York: New York University Press, 2005).

[59] Nikita Buckhoy, "Environmental justice for whom?: a social construction framework analysis of executive order 12898," *Environmental Justice*, 8(5) 2015, pp. 157-164; Checker, *Polluted Promises*; Rachel Godsil et al., "Contaminants in the air and soil in New Orleans after the flood: opportunities and limitations for community empowerment," in *Race, Place, and Environmental Justice After Hurricane Katrina: Struggles to Reclaim, Rebuild, and Revitalize New Orleans and the Gulf Coast*, Robert D. Bullard and Beverly Wright (Eds.), (Boulder: Westview Press, 2009), pp. 115-138.

[60] Godsil et al., "Contaminants in the air and soil in New Orleans after the flood."

complex facing an uphill struggle to have their questions and concerns addressed by the facility's operators, government leaders, and scientists.[61] For this reason, the mobilization of activists in Russia, just as in Godsil et al.'s case study relating to the aftermath Hurricane Katrina, has served vital roles to demand official recognition of victimized communities and their right and capability to know what scientists and state authorities know, along with the opportunity to actively participate in decision-making processes that will affect them using that knowledge.[62]

EJ and Lefebvre's theory of the social production of space

The preceding overview of EJ illustrates the movement's emergence out of socially, historically, politically, and spatially contingent conditions that, despite such contingency, can nonetheless serve to frame and contest social-environmental inequalities along racial, ethnic, class, and other markers of difference across the world. In relation to the sociospatial questions of critical geography and EJ, the theoretical framework of this research centers on analyzing space itself as a product of society, a concept adopted by critical geographers from the work of twentieth century French theorist, Henri Lefebvre.[63] In relation to this theoretical framework, I probe the production of space in

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[61] Brown, *Plutopia*; Garb and Komarova, "Victims of 'Friendly Fire' at Russia's Nuclear Weapons Sites"; Natalia Mironova, Maria Tysiachniouk, and Jonathan Reisman, "The Most Contaminated Place on Earth: Community Response to Long-Term Radiological Disaster in Russia's Southern Urals," in *Cultures of Contamination: Legacies of Pollution in Russia and the U.S.*, [Book series] Research in Social Problems and Public Policy, Volume 14, Michael R. Edelstein, Maria Tysiachniouk and Lyudmila V. Smirnova, Eds., pp. 165-183, (Bingley, UK: Emerald Group Publishing, Ltd., 2007).

[62] Ibid.

[63] For examples, see: Don Mitchell, *The Right to the City: Social Justice and the Fight for Public Space*, (New York: The Guilford Press, 2003); Rob Shields, *Lefebvre, Love & Struggle: Spatial Dialectics*,

Soviet society—specifically in the post-World War II landscape of the Southern Urals—which was characterized by social-environmental inequality as a form of structural violence in the shadow of PO Mayak. Relatedly, as the discovery of the health effects of river-borne radioactive contamination upon local populations began to reach regional authorities and scientists, there emerged a new kind of regime in which privileged knowledge created its own set of subjects. This regime made knowledge about the health risks which permeated the Techa River Valley accessible only to a minority of elites, most of whom lived at a safe distance in relatively urbanized areas such as the closed city of Ozyorsk and as far away as the elite research institutions in Moscow and Leningrad, while rural communities, whose daily lives depended on the Techa River, continued to live with its contamination unaware of its inherent risks.[64] Therefore, the concrete fact of proximity to the source of radiation as a direct relationship with lethal health risks, along with the sociopolitical practices and conditions which restricted access to knowledge about this spatially-contingent risk is where I see the necessity of placing the production of space at the center of questions about what was and what was not accidental exposure. In this way, I situate un-accidental exposure to radiation and this regime of privileged knowledge as a matter of the unjust production of space. At the same time, however, this

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(New York: Routledge, 1998); Neil Smith, *Uneven Development: Nature, Capital, and the Production of Space*, (Cambridge, MA: Basil Blackwell Inc., 1990); Edward W. Soja, *Postmodern Geographies: The Reassertion of Space in Critical Social Theory*, (New York: Verso Books, 1989).

[64] Mironova et al., "The Most Contaminated Place on Earth."

history exemplifies in concrete terms, Lefebvre's theorization of the process by which space is socially produced, along with the set of relations of which it is constituted.[65]

Numerous scholars attest to the versatility and universal potential of Lefebvre's theory which, to provide a truncated summary, proposes that social spaces are social products.[66] That is, social spaces are defined by—and in turn, take an active role in defining—a given society's power structures, social relationships, and means of production. Within the context of Lefebvre's theory, in considering the case of racist policies and practices such as segregation, along with its de facto continued existence after Jim Crow laws were officially dismantled decades ago, the understanding of space as a social product clarifies the key relationship between the sociopolitical oppression of African Americans and the institutionalized control of space which exposed—and continue to expose—these communities disproportionately to the harmful by-products of industrial production—or waste processing and recycling in certain cases—in a given society while simultaneously depriving them of equitable access to the benefits of being active participants and contributors within that society.[67] In order to show how Lefebvre's theory of the production of space connects with EJ in the U.S. and the potential for using this theory to frame diverse social-environmental processes across the

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[65] Lefebvre, *The Production of Space*.

[66] David Harvey, *The Condition of Postmodernity: An Enquiry into the Origins of Cultural Change*, (Malden, MA: Blackwell Publishers Inc., 1990); Alexander Loftus, *Everyday Environmentalism: Creating an Urban Political Ecology*, (Minneapolis: University of Minnesota Press, 2012); Smith, *Uneven Development*; Soja, *Postmodern Geographies*; Kirsten Simonsen, "Bodies, Sensations, Space, and Time: The Contribution from Henri Lefebvre," *Geografiska Annaler*, 2005, 87 B(1), pp. 1-14.

[67] Lefebvre, *The Production of Space*; Pellow, *Garbage Wars*.

world, I will first clarify Lefebvre's use of the term "product" to describe and refer to space. I will then follow this clarification with a consideration of Lefebvre's attention to the processual nature of producing space.

First, Lefebvre's concept of social space as a "product" aims to arrive at a unitary theory of space that, unlike earlier theories, does not restrict it to being either a purely abstract idea, nor a geometric materiality, or even specific kinds of social spaces such as those within urban contexts. Instead, Lefebvre argues for perceiving the multiplicity of things that space and sociospatial relations encompass:

> (Social) space is not a thing among other things, nor a product among other products: rather, it subsumes things produced, and encompasses their interrelationships in their coexistence and simultaneity.... At the same time there is nothing imagined, unreal or 'ideal' about it as compared for example, with science, representations, ideas or dreams.[68]

A key insight within this conceptualization of the social production of space is that it illuminates the possibility for a critical framing of non-social processes such as the physical and chemical mechanics of how toxic substances, for example, behave in the environment alongside the sociopolitical processes, such as racial segregation or exploitative labor practices that restrict particular social groups, such as African Americans and other racial/ethnic minorities, low-income and/or working class populations, into residences or workplaces where they will be dangerously exposed to such toxins. At the same time, the multiplicity of space, conceptualized this way, highlights a versatility that can be usefully applied to a variety of social contexts throughout the world, particularly in analyzing questions of social-environmental

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[68] Lefebvre, *The Production of Space*, p. 73.

conflict. Second, Lefebvre underscores the processual nature of the social production of space, which, heavily informed by Marxist critiques of capitalism, focuses on making visible the role of political and economic processes involved, on a continuous and temporal basis, in producing space. In this way, he builds on the Marxist dialectical understanding of production and consumption to propose that even as space is "a product to be used, to be consumed, it is also a means of production; networks of exchange and flows of raw materials and energy fashion space and are determined by it." [69] By overlapping the concepts of the processual nature of social space while also asserting that it is an inherent element of a society's means of production, Lefebvre also aimed to draw attention to the interrelationships between elements—in particular, the political, economic, scientific, bureaucratic realms—that work simultaneously and in sync, but which, as he observed, were too often analyzed in isolation from each other.

This treatment of the interwoven nature of these seemingly discrete realms offers a framework which supports Taylor's argument for recognizing, in the American historical context, the roots of EJ in early civil rights struggles on issues such as racial segregation, substandard housing conditions for African Americans before 1865, or the fight for establishing minority workers' rights in Chicago's garbage collection and waste processing services.[70] I consider Lefebvre's emphasis on not only the interrelationships between the means of production, social division of labor, structures, and superstructures of modern societies, but also the range of scales from as broad as the globe to as local as

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[69] Ibid. 85.

[70] Taylor, "The rise of the environmental justice paradigm"; Pellow, *Garbage Wars*.

the body, in which the concrete and abstract aspects of space mesh in ways that do not follow dualistic schemas.

Globalizing environmental justice

David Harvey shares Lefebvre's deep engagement with Marxist critiques of capitalism, as he incorporates and builds on them within his own analyses of sociospatial production. However, Harvey's approach to space is set apart by his more rigorous analysis of capitalist political economy and crises of over-accumulation, particularly throughout late modernity.[71] An important element of his illustration of how capitalist logic has led to crises of over-accumulation involves drawing connections between the processes and relationships that are put to work by capitalism to produce space and "spatiotemporal fixes" to these crises.[72] Specifically, in relation to EJ issues, Harvey has contemplated at length the problem of demonstrating how the political economic logic behind the "spatial fix" to capitalist crises contributes to environmental injustices in specific ways, such as the American historical examples discussed above.[73] In this way, Harvey argues that social and environmental justice can and must be made universally relevant.

In *Justice, Nature, and the Geography of Difference*, Harvey cites a leaked World Bank memo in which an influential economist, Lawrence Summers, laments what he observes as the "under-pollution" of places such as certain countries in Africa, and the basic idea that such places, invariably of deep and widespread poverty, represent the most

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[71] Loftus, *Everyday Environmentalism*.

[72] Ibid., 113.

[73] Harvey, *Justice, Nature, and the Geography of Difference*.

ideal locations for toxic and heavily polluting industrial operations.[74] According to the neoliberal market logic conveyed in this memo, the externalities or costs of establishing toxic industries in these countries—as measured in absolute terms in relation to the cost of treating resultant health impacts—are the lowest, thus rendering these particular sites the most cost-efficient.[75] The hypothetical trade-off for populations in those countries would be the "welfare-enhancing benefits" of revenue brought in by such industries in these economically marginalized locations.[76]

Using the "impeccable economic logic" conveyed in this memo, Harvey demonstrates how the role of such logic works in ways that have also been shown to disproportionately afflict racial and ethnic minorities.[77] In particular, across all racial and ethnic categories, working class and low-income populations are caught in such a position where socioeconomic and environmental vulnerability is turned into market value.[78] Noting the prevalence of cost-benefit analyses in contributing to situations of environmental injustice, Harvey writes: "Money is always a form of social power and an instrument of discipline in social relations rather than a neutral universal equivalent with which to calculate 'welfare-enhancing benefits.'" [79] Furthermore, he anchors this connection between cost-benefit analyses and the production of space carried out on

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[74] Ibid., 366.

[75] Ibid.

[76] Ibid., 366.

[77] Ibid., 367.

[78] Ibid.

[79] Ibid., 388.

terms of uneven social relations in which money and the question of "welfare-enhancing benefits" serving as a disciplinary instrument in neoliberal, capitalist economic logic, more often than not, renders those who are the most economically and politically disenfranchised the "losers" of sociospatial production.

In the context of EJ issues in the U.S., Harvey cited a public health research finding in which a highly disproportionate amount of minority and low-income children under six years of age in Baltimore had been found to have elevated lead amounts in their blood or suffered from blood poisoning.[80] As Harvey pointed out, most of these children lived in neighborhoods that are characterized by poorly maintained housing, and where lead paint was prevalent throughout their homes despite having already been banned about twenty years prior to the time during which the cited study took place. Furthermore, he noted that the economic rationale of cost-benefit analyses played a key role in the production of these lethally toxic homes and multiple generations of children with jeopardized health and uncertain futures: "[T]he costs of lead-removal would either drive rents up or render inner-city landlordism of the poor so unprofitable as to exacerbate the already serious problems of housing abandonment." [81] This example of the relationship between poisoned generations of inner-city residents and capitalist logic in the production of urban space is also captured by Harvey's concept of the "spatial fix":

> ...[The "spatial fix is] one of the central contradictions of capital: that it has to build a fixed space...necessary for its own functioning at a certain point in its

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[80] *Baltimore Sun*, February 27, 1994, cited in Harvey, *Justice, Nature, and the Geography of Difference*, p. 393.

[81] Ibid., 393.

> history only to have to destroy that space (and devalue much of the capital invested therein) at a later point in order to make way for a new "spatial fix" (openings for fresh accumulation in new spaces and territories)….[82]

By following Harvey's explanation of how capitalism "fixes" crises of over-accumulation spatially and socially, one can see that the same rationale that justifies allowing impoverished residents to live indefinitely in decaying, lethally toxic homes and neighborhoods, perpetuated by the social and legal structure of property relationships, as framed in Lefebvre's conceptualization of space and society, may later on re-emerge as the "urban renewal" logic that razes, then prices longtime residents out of those homes in order to "clean up" a neighborhood, in favor of newly built housing that, as is often the case, may then be prohibitively expensive for the former residents.[83] The underlying social relationship forged from this rationale is one in which certain groups, marked by class, race, ethnicity, or any one of many markers of marginalization and vulnerability, face structural, societal obstacles in accessing the legal and political process to determine the terms of where and in what conditions they can live.

As Harvey observes, this intersection between sociospatial disenfranchisement and greater physical and mental health risks, parallels the inequitable sociospatial relationships that are among the central objects of critique by EJ movements across the

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[82] David Harvey, "Globalization and the Spatial Fix," *Geographische Revue*, 2001, 3(2), pp. 23-30.

[83] David Harvey, *Social Justice and the City*, (Athens, GA: University of Georgia Press, 2009); Marianne Maeckelbergh, "Mobilizing to stay put: housing struggles in New York City," *International Journal of Urban and Regional Research*, 2012, 36(4), pp. 655-73.

world, sometimes employing terms such as "environmentalism of the poor." [84] It is also precisely this same kind of uneven social and political relationship and process of producing space that, through the symbolism of money as a "welfare-enhancing benefit," will often pit such groups against each other, whether they are indigenous groups "fixed" in reservations or other economically depressed landscapes, or countries with struggling economies, each competing and sometimes even opposing EJ activism against the dangerously close siting of heavily polluting industries, in order to "accommodate the waste in return for money incomes." [85] In the case of the Techa River Valley in the present day, such conflict pits local social-environmental activists against the same economically struggling communities that are the most heavily impacted by the legacy of contamination. These communities' prospects for survival and prosperity are eclipsed by chronic unemployment, devaluation of local land, and the stigma attached to local landscapes which are now associated with contamination.[86]

With the aim of visualizing a possibility for the unison of otherwise disparate groups that have been socially, politically, and environmentally disenfranchised and dislocated, Harvey advocates for the recognition of the relationality entwining their fates.

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[84] Juan Martinez-Alier, "Ecology and the poor: a neglected dimension of Latin American history," *Journal of Latin American Studies*, 1990, 23, pp. 621-39. [Cited in Harvey, *Justice, Nature, and the Geography of Difference*, p. 390].

[85] Harvey, *Justice, Nature, and the Geography of Difference*, p. 369.

[86] Elena Givental, "Three Hundred Years of Glory and Gloom: The Urals Region of Russia in Art and Reality," *SAGE Open*, 2013, 3(2): 1-9; Michael R. Edelstein and Maria Tysiachniouk, "Psycho-Social Consequences due to Radioactive Contamination in the Techa River Region of Russia," *Cultures of Contamination: Legacies of Pollution in Russia and the U.S.*, Series: *Research in Social Problems and Public Policy*, Vol. 14, Michael R. Edelstein, Maria Tysiachniouk, Lyudmila V. Smirnova, Eds. (Bingley, UK: Emerald Group Publishing, Ltd., 2007).

As he dares to hope, grassroots EJ movements in these disparate, far-flung places across the world can "adopt a politics of abstraction capable of reaching out across space, across the multiple environmental and social conditions that constitute the geography of difference" and realize the universal potential of these movements.[87]

Marxist dialectical thought and Soviet discourse on social-environmental relations

In the context of how Marxist ideas were put to work in the Soviet Union throughout its history, the concept of the dialectic took on a prominent role in official discourse.[88] However, numerous Western European and Anglo-American Marxist theorists and political ecologists point out ways in which prevailing Soviet discourse regarding nature-society and human-environment relations reified dualistic concepts. Drawing from Alfred Schmidt's critique of Friedrich Engels' application of dialectical thinking to nature, Neil Smith notes that, especially throughout Stalin's years of leadership in the Soviet Union, Engels' adaptation of the "dialectic of nature" became rigidly "codified as official Soviet doctrine," constructing nature as "external to human society" as in a dualistic, rather than truly dialectical sense.[89] Andy Bruno observes patterns of this Stalinist version the nature-society dialectic through his environmental-historical research on Soviet

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[87] Ibid. 400.

[88] Mark B. Adams, "The Soviet Nature-Nurture Debate," *Science and the Soviet Social Order*, Loren R. Graham, Ed., (Cambridge: Harvard University Press, 1990), pp. 94-140; Robert C. Tucker, *The Lenin Anthology*, (New York: W.W. Norton & Co., 1975).

[89] Alfred Schmidt, *The Concept of Nature in Marx*, (London: NLB [New Left Books], 1971), cited in Smith, *Uneven Development*, p. 35.

industrialization in the Arctic region.[90] While Bruno does not believe Stalin espoused an inherently hostile or antagonistic position towards nature, he finds that one of the main guiding premises underlying Stalinist dialecticism of Soviet planners aiming to bring industrial development to the Khibiny Mountains of Kola Peninsula framed humans and the non-human realm as a dualistic power struggle based on "[d]ominance over nature."[91] In this way, the Stalinist brand of dialecticism manifest in "discussions about how polar nature would be improved through human activities" while also aggressively "severing dependence on the non-human world" [92] At the same time, such plans were framed with the vision of striving towards a classless, socialist utopia. Another important dimension of Stalin's nature-society dialectic that distinctly positions it at odds with political ecology relates to its dogmatic framing as a "science." [93] Referring to the Stalinist-era development of the "science of dialectics," Loftus makes note of Hungarian Marxist theorist György Lukács' criticism of Soviet dialecticians' adoption of positivism in the science of dialectics, along with its implicit technological determinism and tendency towards reifying dualism, as mentioned above.[94] In particular, Loftus sees Lukács' opposition to the tendency of Soviet dialecticians, such as Nikolai Bukharin, as wrongly

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[90] Andy Bruno, *The Nature of Soviet Power: an Arctic Environmental History*, (New York: Cambridge University Press, 2016).

[91] Ibid., 75.

[92] Ibid., 75.

[93] Michel Foucault, "Society Must Be Defended": *Lectures at the Collège de France, 1975-1976*, translated by David Macey, (New York: Picador, 1997).

[94] György Lukács, History and Class Consciousness, (London: Merlin Press, 1971), cited in Loftus, *Everyday Environmentalism*.

attempting to fit the principles of physical science and "subject-object dualism" to the study of social phenomena.[95] In other words, Lukács railed against what he perceived in Soviet intellectual work as a trend towards an uncritical hegemony of knowledge production that was forgetting its Marxist disposition for approaching social questions with the awareness of power relations embedded in social reality instead of accepting them as given phenomena.

Such critiques are specifically directed against the "scientific Marxism" that gained its momentum during Stalin's years, 1924-1953.[96] However, it is worth being cautious against allowing Stalin's three-decade long shadow to obscure one's view of the heterogeneity within Soviet history. In this sense, notable works from the late Soviet years indicate that Soviet intellectuals and scientists had begun to adopt reflexive approaches to the concept of dialectics and the conceptualization of nature and society. For example, in a 1975 essay engaging with theoretical directions in Soviet geography, geographer Vsevolod Anuchin points to the need to overcome dualistic perspectives of society and ecology, which tended to be separated within the broader field of geography in the Soviet Union as the "landscape sphere" and "geographical environment" subfields, respectively.[97] Anuchin argues that this dualistic separation of nature and society had become a serious obstacle for the intellectual growth of theory and practice in geography.

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[95] Loftus, *Everyday Environmentalism*, p. 61.

[96] Ethan Pollack, *Stalin and the Soviet Science Wars*, (Princeton: Princeton University Press, 2006).

[97] Vsevolod Anuchin, *Soviet Geography Today: Aspects of Theory* (1981). "The Relationship between Society and Nature in the Geographical Environment and Philosophical Aspects of Geography," in *Soviet Geography Today: Aspects of Theory*, L. N. Kudryasheva (Ed.), translated by Katherine Judelson, (Moscow: Progress Publishers, 1981), pp. 157-176.

Although by dwelling on concepts of scientific laws within geography, society, and nature Anuchin still demonstrates a lingering influence of positivism rooted in Stalinist "scientific Marxism," he also expresses a clear departure from the discourse based on the conquest of nature that had prevailed in previous decades. As he writes:

> Now when intensified specialization and the one-sided development of science and its use in practical affairs have proved inadequate, when we are confronted by the disruption of the overall link between phenomena, which development in its turn places the very life of [humankind] under threat, scientists must set themselves the task of elaborating scientific synthesis, start to blur the dividing lines between sciences, in particular between the sciences concerned with nature and those concerned with the development of society.[98]

Missing from this discourse is a concern for the power relations within which such development occurs as well as attention to questions about inequitable social relations. The absence of such discussion may be related to what the scholar of Russian environmental history, Douglas R. Weiner believes relates to a characteristic strategy of Soviet scientists since the late 1920s to avoid framing their arguments in terms of moral concerns, but rather within strictly scientific rationales instead.[99] As he writes, in contrast to scientists' relative freedom to express ethical views during the Soviet years that preceded Stalin's rule, scientists' re-framing of ecological concerns as "an exclusively 'scientific' problem of ecology was an adaptive response by movement leaders, who

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[98] Ibid. 174.

[99] Douglas R. Weiner, *A Little Corner of Freedom: Russian Nature Protection from Stalin to Gorbachev*, (Berkeley: University of California Press, 1999).

recognized that the Bolsheviks might heed those speaking in science's name but might persecute those who advanced 'moral' arguments for policy." [100]

Despite Anuchin's apparent belaboring of the issue of treating the nature-society dialectic solely in terms of advancing science while omitting questions of social and political relations—a possible discursive strategy with a long and complex history, as Weiner's study illustrates—this excerpt indicates that it is inaccurate to portray the Soviet scientific community as an unchanging monolith that remained perpetually stuck in Stalin's dogmatic dialecticism. Instead, Anuchin's concern regarding the need for science to conceptually integrate humans and nature suggests that Soviet scientists and theorists made reflexive and self-conscious efforts to confront and correct what some viewed as flawed premises.

Anglophone Marxist ideas and Soviet science: epistemological differences

Apart from the dialectical conceptualization of nature and society, there is a second important area that takes on a key role within Anglophone and Western European arguments on Marxist theorizations of the relationship between social and environmental justice. In a way that relates to the elevation of the science of dialectics to a positivist and hegemonic mode of Stalinist knowledge production, Anglophone and Western European political ecologists have critiqued similar tendencies in hegemonic systems of knowledge production within capitalist societies. As geographer Roderick Neumann has noted in his comprehensive review and illuminating discussion of the multi-dimensional development and scope of the field of political ecology along with its theoretical, methodological, and

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[100] Ibid. 12.

practical applications, among the defining characteristics of scholars whose works have later been identified as forerunners has been a critical approach towards knowledge production, and the adoption of analytical frameworks that do not take scientific knowledge as absolute or objective truth.[101] In other words, political ecology upholds the idea, along similar lines as Lukács' criticism of the Stalinist science of dialectics, that scientific knowledge—biophysical, sociocultural, ecological, etc.—is socially constructed and thus needs to be viewed critically.[102] This is not to confuse the world itself as inherently "socially constructed," but to acknowledge that scientists, as human beings, cannot entirely avoid their own positionality as they formulate particular questions about particular objects.[103] For this reason, the production of scientific knowledge requires rigorous critique, peer review, and consensus as a check against bias.[104] These aspects of the scientific method form part of what lends science its reliability and validity as a way of approaching knowledge of the world.[105] Furthermore, they help avoid both the insufficiently rigorous and overly relativist analyses of anti-scientific stances—common in climate change denial or creationism, for example—yet allow self-reflexivity and attention to contingency of specific histories and geographies as well as the important roles of sociopolitical relations and power differentials in the process of inquiry.

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[101] Roderick Neumann, *Making Political Ecology*, (London: Hodder Education, 2005).

[102] Ibid.

[103] Donna Haraway, "Situated knowledges: the science question in feminism and the privilege of partial perspective," *Feminist Studies*, 14(3) 1988, pp. 575-599.

[104] Bruno Latour, *Science in Action: How to Follow Scientists and Engineers through Society*, (Cambridge, MA: Harvard University Press, 1987); Naomi Oreskes, "Science and public policy: what's proof got to do with it?" *Environmental Science & Policy*, 2004, 7, pp. 369–383.

[105] Oreskes, "Science and public policy."

Particularly relevant for EJ, is that these approaches allow for questions regarding the subjectivity of scientists who investigate the impacts of environmental damage on populations. As numerous EJ scholars and social theorists have noted, the authority invested in scientists representing state or corporate interests enables their findings regarding social-environmental conflict, such as the environmental and health impacts of toxic exposure, for example, to be accepted as truth, even though closer scrutiny has revealed serious biases, flaws or insufficiently rigorous analysis in such research.[106]

In the case of the health and social impacts of radioactive contamination from the PO Mayak complex in Russia, after the existence of the facility and its history of pollution was officially acknowledged in the late 1980s, scientists responding to rural residents' claims of victimization by unchecked radioactive pollution from the Mayak plant demonstrated a tendency to dismiss suspicions regarding the connection between radioactive contamination and symptoms of radiation illness by portraying claims as schemes for extorting compensation from the state and resorting to criticism of victims' lifestyles such as the high incidence of alcohol abuse.[107] Such portrayals of the populations most exposed to contamination—largely rural—betray scientists' class biases in how they perceived rural and working class populations. As Edelstein and Tysiachniouk note, this reflects attitudes that have persisted since the far into the Soviet

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[106] Beck, *Risk Society*; Checkers, *Polluted Promises*; Godsil et al., "Contaminants in the air and soil in New Orleans after the flood."

[107] A. V. Akleyev, *Cheliabinskaia oblast': likvidatsiia posledstvii radiatsionnykh* avarii, (Chelyabinsk: Iuzhno-Ural'skoye knizhnoe izdatel'stvo, 2006); Brown, *Plutopia*; Edelstein and Tysiachniouk, "Psycho-social consequences due to radioactive contamination"; Mironova et al., "The Most Contaminated Place on Earth."

period.[108] The tendency for scientific authority to undermine local residents' contestations of established scientific knowledge, often by making implicit references to their rural and lower class backgrounds in order to cast doubt upon their credibility, reflects an aspect of social and environmental injustice that relates not merely to matters of inequality, but to recognition, capability, and participation of victims, all of which refer back to the broader sociopolitical structures and conditions which are responsible for creating inequality itself.[109]

Soviet science vs. social and environmental justice

The preceding sketch of the intellectual heritage of Marxist critical theory, specifically in terms of conceptualizing nature-society relations, shared by the Soviet status quo and Anglophone as well as Western European Marxist thought demonstrates how wildly the interpretations of Marxist critical theory can diverge. In this respect, it is worth contemplating Lefebvre's questioning of whether or not Soviet socialism was succeeding in creating a revolutionary social space, and whether or not Soviet society could indeed be defined as "real" socialism or communism—that is, an actual alternative to capitalist production of space. By way of expressing his own doubts, Lefebvre outlined what he considered two options for a socialist society to proceed, the first of which seems to imply what he considered to be the path taken by the Soviet Union, the second being the ideal alternative he envisioned:

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[108] Edelstein and Tysiachniouk, "Psycho-social consequences due to radioactive contamination."

[109] Schlosberg, *Defining Environmental Justice*.

> The first of these would opt for accelerating growth, whatever the cost, whether for competition, prestige, or power. According to this scenario, state socialism would aim to do no more than perfect capitalist strategies of growth, relying entirely on the proven strengths of large-scale enterprise and large cities, the latter constituting at once great centres of production and great centres of political power...The second strategy would be founded on small and medium-sized businesses and on towns of a size compatible with that emphasis...The inevitable urbanization of society would not take place at the expense of whole sectors, nor would it exacerbate unevenness in growth or development....[110]

The first scenario, particularly with the emphasis on "competition, prestige, and power," seems to depict Stalin's role in shaping Soviet society, space and politics. His larger-than-life drive and support for industrial growth and production,[111] and the oppression of peasants, particularly in the context of the not-so-accidental 1930s famines which devastated rural populations the most,[112] also serve as concrete examples of extreme "inequalities in development and the abandonment of whole legions...of the population".[113] However, while this may be a fair assessment of some of the key ways in which Soviet sociospatial inequalities developed under Stalin's leadership, the portrayal is incomplete if it does not consider the geopolitical context of that period in time, along with corresponding factors that could help explain Stalin's perceived need to consolidate political and economic power, particularly through the acceleration of industrial growth at any cost. As Ronald Grigor Suny describes the chaotic situation of the earliest years of

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[110] Lefebvre, *The Production of Space*, p. 55.

[111] Bruno, *The Nature of Soviet Power*; J. Arch Getty, *Practicing Stalinism: Bolsheviks, Boyars, and the Persistence of Tradition*, (New Haven, CT: Yale University Press, 2013).

[112] Lynne Viola, *The Unknown Gulag*, (New York: Oxford University Press, 2007).

[113] Lefebvre, *The Production of Space*, p. 55.

the new Bolshevik government, "Russia slid into civil war, [and] the Bolsheviks embarked on a program of regenerating state power that involved economic centralization and the use of violence and terror against their opponents." [114]

Soviet society, as much as its leadership attempted to insulate itself from potential opponents and intervention, did not develop in isolation but rather in inescapable relationality with the rest of the world.[115] Therefore, I argue that geopolitical contexts must be included in an analysis of how society, space, and power relations developed—all relevant aspects of an EJ theoretical framework—during this period of Soviet history. The absence of substantial consideration of such geopolitical contexts in Lefebvre's discussion of "socialist" space in the Soviet context amounts to one of the key flaws in his criticism of it.

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[114] Ronald Grigor Suny, *The Structure of Soviet History: Essays and Documents*, 2nd edition, (New York: Oxford University Press, 2014).

[115] John C. Campbell, "The Soviet Union in the International Environment," in *Prospects for Soviet Society*, Allen Kassof (Ed.), (New York: Praeger Publishers, 1970), pp. 473-496.

CHAPTER III: SOCIOSPATIAL INEQUALITY IN RUSSIAN AND SOVIET HISTORY

Introduction

In the United States, the pioneers of EJ made poignantly visible the environmental and spatial manifestations of Jim Crow, environmental racism, and other forms of social inequality and structural violence experienced by socially and economically marginalized populations. EJ scholars have shown that the roots of the sociospatial production of environmental injustice in its American context were borne out of not only racist ideologies and attitudes but also a political economic rationale on which institutionalized racism was structured.[116] The field of environmental justice has also proved invaluable in recognizing social-environmental inequality outside of the American historical contexts in which it developed. However, synthesizing theoretical approaches to address Soviet social-environmental inequalities also requires centering the distinct history of Russia and the former Soviet Union in the context of its distinct space and place. In this chapter, I will first present a brief overview of historical contexts of social difference and structural violence in Russian and Soviet history. This will draw particular attention to the tsarist control of space to maximize its power over the Russia Empire's subjects and how it produced sociospatial inequalities. Second, I will consider the changes introduced by the Bolsheviks' ascent to power, specifically in relation to the implementation of policies intended to promote social equality, and how Joseph Stalin shaped the fate of such policies. Third, I will briefly review selected literature engaging with Soviets' concern

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[116] Laura Pulido, "Geographies of race and ethnicity II: environmental racism, racial capitalism and state-sanctioned violence," *Progress in Human Geography*, 2017, 41(4) 524–533; Sidney Mintz, *Sweetness and Power: The Place of Sugar in Modern History*, (New York: Penguin Books, 1985).

with national minorities and its implications for the development of Soviet identities, social relations, national belonging, the special significance of the Great Patriotic War, and how this history impacts social relations in Russia today. Following this discussion of the legacy of Soviet national identities, I will focus on the Southern Urals at the dawn of the Atomic Age and the production of sociospatial inequality before the contamination of the Techa River Valley occurred.

Violence and Space in the Russian Empire

In the history of Russia and of the lands once encompassed by the Soviet Union as well as the Russian empire, one can also recognize unjust social relations that resulted in systemic oppression and other-ing, rooted in ideology as well as economic exploitation in relation to colonization. However, there are also two aspects of this history that defy drawing easy parallels with other colonial histories and which render Eurasia a special case. First, Eurasia is characterized by a territorial contiguity that has enabled movements of and encounters between a very heterogeneous range of peoples, throughout a much longer stretch of time than that for which we have comparable records in relation to the Americas.[117] Second, the Russian Empire's turn towards global markets also warrants special consideration. As some of the most defining aspects of the Americas' role in the Atlantic slave trade are related to the development of a global capitalist system in tandem with modernization and colonialism,[118] it is

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[117] Denis J.B. Shaw, *Russia in the Modern World: A New Geography*. (Malden, MA: Blackwell Publishers Inc., 1999).

[118] Mintz, *Sweetness and Power*.

worth considering aspects of Russia's colonial history that relate more directly to the emergence of capitalism in conjunction with imperial ventures and how they influenced the treatment of social difference in Russian society.

As Tlostandova and Mignolo observe of the legacy of the Russian empire, particularly since the seventeenth century, it is characterized by state-society relations that were defined by oppression, dislocation, and symbolic as well as concrete violence.[119] Such an observation gives rise to the questions of who oppressed whom? Who was dislocated, from where to where? Who inflicted violence upon whom? To address these questions, I begin by noting that social difference in Russian society throughout its history can be read not only along ethnic lines. Other markers of difference such as religion and class have carried as much, if not greater, weight in terms of belonging and otherness.[120] Along with social or class status, racial, ethnic, and religious difference were all cause for being marked as "others" and oppressed.[121] However, historian Michael Khodarkovsky notes that instead of the concept of race or ethnicity, "[s]eparateness or foreignness was defined through language, territory,

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[119] Madina V. Tlostanova and Walter D. Mignolo, *Learning to Unlearn: Decolonial Reflections from Eurasia and the Americas (Transoceanic Series)*, (Columbus: Ohio State University Press, 2012).

[120] Michael Khodarkovsky, "Ignoble Savages and Unfaithful Subjects," in *Russia's Orient: Imperial Borderlands and Peoples, 1700-1917*, Daniel R. Brower and Edward J. Lazzerini (Eds.), (Bloomington: Indiana University Press, 2001), pp. 9-26.

[121] Mark Bassin, "Inventing Siberia: Visions of the Russian East in the Early 19th Century," *American Historical Review,* 96(3) June 1991: 763-94; Kevin Alan Brook, *The Jews of Khazaria*, (New York: Rowman & Littlefield Publishers, Inc., 2006); Ronald Grigor Suny, *The Soviet Experiment: Russia, the USSR, and the Successor States*, (New York: Oxford University Press, 2011); Tlostanova and Mignolo, *Learning to Unlearn*.

kinship, or religion." [122] Contrary to Khodarkovsky, Bassin finds that indigenous groups, especially native Siberian peoples, were frequently portrayed in Russian literature and artistic depictions as primitives to be conquered, explicitly evoking American pioneers' encounters and subjugation of indigenous groups in North America, in ways that reflect racialized discourses of difference.[123] At the same time, tsarist officials forced Siberian indigenous groups to pay tribute in the form of animal furs or *iasak* to supply the Russian empire's global fur trade as one of its main sources of wealth.[124]

In relation to religion and ethnicity, two of the many examples of state-endorsed violence framed within discourses of religious or ethnic difference include the massacre and forced exile of ethnic groups such as the Ingush, Chechens, Dagestanis, and Circassians/Cherkess, among others—some of whom were erroneously assumed to be Muslim at the time—from the Caucasus region and Black Sea coast, and forcibly exiled to distant lands such as Ottoman Turkey.[125] Similarly, Jewish populations experienced brutal pogroms and other forms of violent persecution and discrimination at the hands of imperial forces as well as civilians across several centuries, particularly along the western

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[122] Khodarkovsky, "Ignoble Savages," 15.

[123] Bassin, "Inventing Siberia."

[124] Ibid.

[125] Austin Lee Jersild, "From Savagery to Citizenship: Caucasian Mountaineers and Muslims in the Russian Empire," in *Russia's Orient: Imperial Borderlands and Peoples, 1700-1917*, Daniel R. Brower and Edward J. Lazzerini (Eds.), (Bloomington: Indiana University Press, 2001), pp. 100-114.

regions of the empire, notably the Pale of Settlement to which they were restricted.[126] Ethnic Russian peasants, particularly those who were perpetually tied to labor as serfs for landowners and made up a large portion of the population, suffered increasing oppression, particularly as a result of a set of restrictive laws established by Tsar Peter I (reign: 1682-1721) to curtail serfs' mobility and curb their tendency to desert landowners.[127]

Brief history of the Southern Urals

The region I refer to as the Southern Urals, where Chelyabinsk Oblast was officially established in 1934, shares with the broader Eurasian steppe within which it is situated an ancient and complex history of human settlement and civilization, marked by continuous encounters, both tumultuous and peaceful, across millennia. During the early modern era, this region had been inhabited by Tatars, along with numerous other distinct ethnic groups, a large proportion of which included the nomadic Bashkirs of Turkic origins.[128] The reign of Ivan III of Muscovy in the 15th century marks the key turning point in the early modern history of Eurasia as he led decisive victories against the dominant Tatars of that period and began to conquer and consolidate the lands that eventually became the

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[126] Brook, *The Jews of Khazaria*.

[127] W. Bruce Lincoln, *The Conquest of a Continent: Siberia and the Russians*, (Ithaca: Cornell University Press, 1994); Richard Pipes, *Russia Under the Old Regime*, (New York: Collier Books, Macmillan Publishing Company, 1992); Shaw, *Russian in the Modern World*.

[128] Michael Khodarkovsky, *Russia's Steppe Frontier: The Making of a Colonial Empire, 1500-1800.* (Indianapolis and Bloomington: Indiana University Press, 2002); A. I. Levit, *Yuzhniy Ural: Geografia, Ekologia, Prirodopol'zovaniye*, [translation from Russian: Southern Urals: Geography, Ecology, and Environmental Management], (Chelyabinsk: Yuzhno-Ural'noye Knizhnoye Izdatel'stvo, 2005);

core of the Russian empire.[129] He also propelled Russia's quest to accumulate wealth oriented towards the lucrative European fur market.[130] The move to capitalize on Europe's high demand for sable furs led to the first official Russian encounters with Bashkirs with whom they formed contractual relationships. This mainly consisted of requiring Bashkirs to pay *iasak* to the Grand Prince Ivan III—as was required of the Siberian indigenous groups—in the form of pelts from sable and other animal species targeted for their fur.[131] As Muscovy grew into the Tsardom of Russia in the 16th century, encounters escalated from payments of tribute to land-grabbing underwritten by the tsar. This practice served to entice Russian peasants to settle what were then considered Russia's "borderlands" in order to establish Russian territory. In many cases, Russian peasants pursued these rare opportunities to escape serfdom.[132] In response, the Bashkirs mounted continuous and violent resistance to Russian encroachment and the seizing of land.[133] Additionally, while the Russian Empire had not always aimed to persecute Muslims, and in fact, at the time even encouraged "pagan" groups to convert to Islam, the central role of the Russian Orthodox religion in Russian identity always cast a

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[129] Pipes, *Russia Under the Old Regime*.

[130] Bassin, "Inventing Siberia."

[131] Ibid.

[132] Khodarkovsky, *Russia's Steppe Frontier*, p. 132, 178.

[133] Ibid. 158.

stark light of "otherness" upon non-Christians, including the Bashkirs, the majority of whom have historically practiced Islam.[134]

Restriction of liberties and land rights for Russian serfs and ethnic minorities

In the history of Russia and the lands once forming part of the Soviet Union as well as the Russian empire, one can recognize parallels and continuities in the power relations that defined these societies, despite the stark ideological differences between tsarist and Soviet governing institutions. Furthermore, such parallels and continuities share distinctly spatial concerns which have played key roles in not only domestic authoritarian practices, but also colonial practices in Eurasian history. For example, during the tsarist era, particularly from approximately the end of the seventeenth century until the revolutionary years of the early twentieth century, an internal passport system was developed which required all subjects of the Russian Empire to be registered with their local authorities from birth.[135] Writing in 1920 for *The Socialist Review*, economist Isaac A. Hourwich, who had emigrated from the Russian empire before the Russian Revolution, warned against increased policing in American society by recounting the oppressive practices of the then recently dismantled tsarist regime of Russia. As he noted, this internal passport system had made it mandatory to always carry one's passport as well as written permission to travel from one's superiors, usually the landowner in the case of serfs, whenever traveling the equivalent of twenty miles or more from one's registered place of

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[134] Michael Khodarkovsky, "Ignoble Savages." For more on tsarist policies regarding Islam and Muslim populations, see also: Robert D. Crews, *For Prophet and Tsar: Islam and Empire in Russia and Central Asia*, Cambridge, MA: Harvard University Press, 2009).

[135] Ibid.; Hourwich, "The Czar's Police." *The Socialist Review*, 8(3) Feb. 1920, pp. 138-142.

residence.[136] Emphasizing the severity of this law's enforcement, Hourwich pointed out that since one could not prove having permanent residence without a passport, a "person who had no 'permanent place of abode' was liable to deportation to Siberia on the charge of vagrancy."[137]

Literature drawing connections between the Enlightenment and social engineering practices in modern history has reflected upon the implications of tsarist Russia's exceptional preoccupation with tracking its population and restricting its mobility across the empire's vast expanse. Importantly, as noted by James Scott in his study of social engineering schemes during Russia's imperial era as well as the Soviet period, being able to count and track individuals served the important purpose of collecting taxes, organizing recruitments for military service, and maintaining social order by policing movement and preventing serfs from deserting landowners.[138] Similarly, the internal passport system formed a key aspect of the means by which the population was restrained and made legible to authorities in the face of sprawling territory and inscrutable wilderness across the Eurasian landmass.

Apart from serving as a deterrent for serfs and soldiers who would be inclined to flee to freedom, the internal passport system also enabled the control of ethnic minorities by making it easier to restrict their movement. Among the most well-known examples of

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[136] Hourwich, "The Czar's Police."

[137] Ibid. p. 138.

[138] James Scott, *Seeing Like a State: How Certain Schemes to Improve the Human Condition Have Failed*, (New Haven: Yale University Press, 1998).

such restrictions is often termed the "Pale of Settlement," a territory along the western edges of the Russian empire, encompassing portions of present-day Lithuania, Poland, Belarus, Ukraine, and Moldova. With few exceptions, Russian imperial law, from 1719 until 1897, when such restrictions slowly began to be abolished, Jewish citizens were prohibited from permanently residing outside of the "Pale of Settlement."[139] In the case of other ethnic minorities, this distinct characteristic of the tsarist form of rule, with its extraordinary investment in the control of its subjects' movements, created particular hardships for traditionally nomadic ethnic groups of the steppe regions along the southern and Central Asian regions of the empire. As Mikhail Khodarkovsky's detailed accounts illustrate regarding the encounters between representatives of the tsars and the many nomadic tribes of the southern steppes over the course of three centuries, the Russian empire learned to contain and subdue the "wild" nomads via persistent encroachment towards the south and southeastern regions towards Central Asia.[140] His analysis of tsarist-era documents demonstrates that a key aspect of the Russian empire's strategy for expanding and colonizing these regions involved freeing a certain number of serfs and utilizing them to settle borderlands.[141] Settlements would eventually be followed by military fortifications in order to gradually build up bases and cities, creating enclosures and barriers impeding nomads' access to grazing lands for their herds and traditional

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[139] Mervyn Matthews, *The Passport Society: Controlling Movement in Russia and the USSR*, (Boulder, CO: Westview Press, 1993), pp. 4-12.

[140] Michael Khodarkovsky, *Russia's Steppe Frontier*.

[141] Ibid.

traveling routes.[142] Ultimately, Russia's constant and increasingly technologically advanced aggressions along the steppe borderlands simultaneously led to the demise of nomadism across the steppe and enabled the conquest of the dislocated nomadic steppe tribes.[143] In this way, non-Russian captives, particularly those captured in battles across the fiercely contentious southern and southeastern steppes and Central Asia during the late eighteenth century were forced into serfdom.[144] A large portion of these non-Russian captives hailed from Tatar as well as Bashkir tribes whose territory encompassed steppe lands that included what is now known as the Southern Urals. As the empire's reach enveloped these lands, the Tatar and Bashkir grazing lands eventually gave way to fixed landscapes of farms and factories.[145]

The sense of loss and continuously increased policing from tsarist forces fueled the Bashkir separatist aims well into the revolutionary years of the early twentieth century. During the Civil War, as the Urals region was among the most embattled areas with heavy fighting, Bashkirs suffered high losses. Following the war, the collectivization of farms contributed to dramatic drops in the Bashkir population of the Urals as a result of both death and mass exodus. Along with the loss of lives, collectivization, with few exceptions, also brought about the end of nomadism and its time-tested relationship with

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[142] Ibid.; Michael Khodarkovsky, "Ignoble Savages and Unfaithful Subjects."; Dov Yaroshevski, "Empire and Citizenship," in *Russia's Orient: Imperial Borderlands and Peoples, 1700-1917*, Daniel R. Brower and Edward J. Lazzerini (Eds.), (Bloomington: Indiana University Press, 2001), pp. 58-79.

[143] Khodarkovsky, *Russia's Steppe Frontier*.

[144] Matthews, *The Passport Society*.

[145] Khodarkovsky, *Russia's Steppe Frontier*.

the particular ecologies of the steppe. Yet, with a promise of hope, the Bolsheviks ushered in a semblance of improvement in social relations. In this way, one of the most notable ways by which Vladimir Ilyich Lenin, the first leader of the new socialist state, aimed to promote equality was the implementation of *korenizatsiya* or the nationalities policy by which the Soviet government granted to non-Russian ethnic groups official recognition as national entities, in the form of territory, language freedom or the opportunity to construct a national language, and representation in government leadership. *Korenizatsiya*, often remembered for the slogan, "national in form, socialist in content," enacted Lenin's answer to the social and territorial dislocation as well as coercive cultural assimilation imposed upon colonized populations not only under the Russian empire, but also, in a global sense, Western European imperial aggressions.

On the question of colonialism and all forms of social inequality, official Soviet ideological discourse aligned with other contemporary socialist movements in direct opposition to such forms of oppression.[146] In this spirit, Lenin instituted a program of *korenizatsiya* whereby the Soviet government strove to allocate territorial and linguistic recognition for all of the ethnic groups which had once been subjected to enslavement, Russification, and conversion to Orthodox Christianity during the tsarist era.[147] However, upon Lenin's death in 1924 and Stalin's ascension to power, Stalin put further

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[146] Robert C. Tucker, *The Lenin Anthology*, (New York: W.W. Norton & Co., 1975); Ronald Grigor Suny**,** *The Soviet Experiment: Russia, the USSR, and the Successor States*, (New York: Oxford University Press, 2011); Peter Nettl, *Rosa Luxemburg* [abridged edition], (New York: Oxford University Press, 1969).

[147] Suny, *The Soviet Experiment*.

development of *korenizatsiya* on hold, and proclaimed the need to institute Russian as the main language of the Soviet Union, while declaring the Russian Soviet Federative Socialist Republic (RSFSR) as the "big brother" of all Soviet republics.[148] In practice, this signaled the return to tsarist-era Russification over the next few years. Additionally, Stalin denounced what he perceived as increasingly oppressive conditions for ethnic Russians, and by 1938, the period of opportunities for ethnic minorities to nurture their socialist solidarity with free reign to maintain distinct national identities had begun to end. In conjunction with Stalin's characteristically deep distrust of minorities, the purges of minority leaders followed not far behind the shelving of *korenizatsiya*. In this way, the revolutionary internationalist ideals of equality and emancipation of minorities and other oppressed groups no longer remained at the top of the Soviet agenda except in lip service and ceremonial spectacle.

On this point, one of the most respected preeminent geographers of the Southern Urals region during the Soviet period, Fyodor Y. Kirin, wrote in 1954 in unpublished lecture notes, held at the Joint State Archives of Chelyabinsk Oblast (OGAChO), the following passage:

> The significance of the RSFSR as a part of the whole Soviet Union is defined not only by the sheer expanse of her territory, population, and economy, but also the leading role of the great *russkogo naroda* [specific term for Russians as an ethnic group] in the history of our country's development, in the construction of socialism, in the defense of the Motherland during the Great Patriotic War, and economic development during the postwar era. The RSFSR is the most multinational republic of all the republics within the Soviet Union. But the overwhelming majority of the population in the RSFSR - approximately 92

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[148] Francine Hirsch, *Empire of Nations: Ethnographic Knowledge and the Making of the Soviet Union*. (Ithaca, NY: Cornell University Press, 2005).

> million out of 112 million, or 82 per cent - is made up of *russkiye* [ethnic Russians].
>
> This is why the republic carries the name of this great [ethnic] people.
>
> Apart from [ethnic] Russians, many other ethnic peoples live in the RSFSR: Tatar, Bashkir, Jewish, Chuvash, Udmurt, Mari, Komi, Kumyk, Laki, Avartsi, Lezgin, Ossetian, Kabardino, Cherkessian, Adygean, Altai, Khakassian, Buryat, Yakut, Nenet, Yevenk, and many others, all comprising about 20 million people or 18% of the population. In tsarist Russia, all of these ethnic groups lived in miserable conditions.
>
> I. V. Stalin noted,
>
> "The politics of tsarism, the policies of landowners, and bourgeoisie impacted these peoples in such a way so as to suppress the formation of nationhood, cripple their culture, stifle their language, keep them oblivious, and finally, to Russify by any means possible."
>
> The victory of the great October revolutionary solidarity brought complete freedom to all the peoples of Russia, and the Leninist national policy ensured for them the right to cultural development, national in form and socialist in content, the right to their own nationhood.[149]

This sentiment reflects one of the predominant Russocentric Soviet attitudes towards the symbolic positions of the diverse Soviet republics and ethnic minorities in relation to Russia and ethnic Russians, particularly during Stalin's rule from 1924 to 1953 along with the ironies that emerged in Stalin's actual treatment of minorities, vis-à-vis the official Soviet rhetoric.[150] Its inclusion within the unpublished lectures of one of the most prominent and well-respected geographers of Chelyabinsk oblast during the postwar period suggests that nationalist conceptualizations of ethnic identity, territorial belonging, were widely accepted, even among intellectuals who otherwise appear sufficiently well-versed in Marxist-Leninist principles, and would therefore be expected to roundly reject

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[149] OGAChO. *Fond* 76, *opis'* 1 *delo* 1, p. 139-140.

[150] Hirsch, *Empire of Nations*; Suny, *The Soviet Experiment*.

nationalistic chauvinism as a bourgeois malaise that stood in contradiction with egalitarian socialist principles.[151]

The formation of a Soviet national identity and its legacy

Contemplating the transition from revolutionary ideals of internationalism to a more hegemonic and Russocentric Soviet nationalism requires a consideration of the heterogeneous, multidimensional, and often self-contradictory nature of Soviet national identities. The relevance of understanding such identities can help place the existence of social difference in the Soviet Union into clearer context, particularly in terms of the Southern Urals region. In this section, I will consider insights from literature regarding the formation of Soviet national identities in relation to the promotion of nationalism and reification of ethnic difference and territory as a transitional stage towards borderless proletarian unity and the Soviet Union's construction of relationships between society and the state as well as the legacy of the Great Patriotic War, as the Second World War is known in Russia. These aspects of Soviet identity formation continue to influence national identities in Russia and former Soviet countries in ways that warrant attention as they continue to play important roles in present-day social and political situations. By taking particular note of the multidimensional and contradictions within these aspects of Soviet identity formation, I also aim to illustrate the need to question oversimplifications of the Soviet past and present-day political issues in Russia and Eurasia.

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[151] Nettl, *Rosa Luxemburg*; Tucker, *The Lenin Anthology*.

Soviet national identities: empire or the international proletariat's fatherland?

Numerous scholars agree that despite the Soviet Union's official denunciation of imperialism, and the Bolsheviks' acceleration towards a visionary future of emancipated societies, the imperial character of power relations in the Soviet state, in key aspects, bore the old empire's lingering imprints. Scholars cite such policies as forced collectivization, repression of cultural and spiritual practices and traditional livelihoods, Russification, the imposition of often arbitrary or ill-fitting ethnic and/or national identities and territorial boundaries, the sometimes destructive cooptation of land and resources, and the marginalization of Othered histories, as a few of the examples of the imperialist nature of the Soviet state's relationship with its citizens.[152] At the same time, however, to uncritically accept the portrayal of the Soviet Union as simply an upgraded version of the Russian Empire would be to overlook the historical importance of the active effort exerted by the most earnest and visionary revolutionary intellectuals in their attempt to construct a new kind of international kinship and identity modeled on Marx's revolutionary ideal of a proletarian internationalist and egalitarian society.[153] This vision proposed that the solidarity of workers of all nations would transcend the burdens and

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[152] Ali Iğmen, *Speaking Soviet with an Accent*, (Pittsburgh: University of Pittsburgh Press, 2012); Viatcheslav Morozov, "Subaltern Empire? Toward a Postcolonial Approach to Russian Foreign Policy," *Problems of Post-Communism* 60(6), 2013: 16-28; Petra Rethmann, *Tundra Passages: Gender and History in the Russian Far East*, (University Park: Pennsylvania State Univ. Press, 2001); David Chioni Moore, "Is the Post- in Postcolonial the Post- in Post-Soviet?" *Pmla* 16(1), 2001: 111-128; Tlostanova and Mignolo, *Learning to Unlearn*.

[153] Hirsch, *Empire of Nations*; Suny, *The Soviet Experiment*; Tucker, *The Lenin Anthology*.

divisions of national, ethnic, or racial identities as such divisions served only the interests of bourgeoisie and capitalists. [154]

While critics such as Tlostanova and Mignolo may dismiss such discourse as empty lip service, one can argue that Vladimir Lenin's emphatic declarations in recognizing the "right of nations to self-determination," even at the discursive level, bore powerful significance on political consciousness at a global scale at the turn of the twentieth century, as imperial regimes were still the predominant norm across the world at that point in time.[155] In the midst of ongoing debates regarding various approaches to the "question of nationalism" among revolutionary intellectuals throughout Europe—particularly one of the most active and prolific contemporary socialist theorists, Rosa Luxemburg—Lenin documented the 1896 Resolution of the London International Congress [a congress of the socialist Second International] calling for the "unequivocal recognition of the full right of all nations to self-determination" in conjunction with "the equally unambiguous appeal to the workers for *international unity* in their class struggle." [156] Throughout the revolutionary years leading up to victorious formation of the Soviet Union, Lenin maintained this stance on balancing the independence of nation-states with the Marxist ideal of international proletariat unity.[157] However, as Suny observes, upon Lenin's death and the rise of his successor, Joseph Stalin, the "question of

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[154] Tucker, The Lenin Anthology.

[155] Ibid. 169.

[156] Nettl, *Rosa Luxemburg*; Tucker, *The Lenin Anthology*, 167.

[157] Suny, *The Soviet Experiment*.

nationalism" began veering away from the vision of socialist internationalism, and more towards a Soviet, yet Russocentric, nationalist identity.[158] Stalin, within his first few years as the new leader of the Soviet Union, began showing inklings of his stark divergence from the early socialist revolutionary ideals by declaring "that the proletariat now had a fatherland." [159] By upholding the idea of a centralized nationalism with which workers should identify, instead of the internationalist concept of borderless proletarian unity, Stalin opened up the opportunity for the Soviet state to begin taking on an imperial character.

At the same time, the sentimentality of rhetoric conjuring the image of a "fatherland," "motherland," or "homeland" had the potential of appealing to the emotional sensibilities of the Soviet masses, Russian and non-Russian alike, and, as Suny points out, the use of emotive language in Soviet discourse helped to not only build a Soviet national identity, but more importantly, one that fostered an "affective community" among citizens.[160] Suny's argument poses a potentially more significant challenge to narratives that characterize the Soviet state as an empire as he highlights the development of Soviet identities among a broad range of citizens, in contrast to the Russian empire's appeal to social elites or Russian Orthodox devotees. To be sure, Suny acknowledges critical exceptions, particularly among the most severely oppressed victims

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[158] Ronald Grigor Suny, "The Contradictions of Identity: Being Soviet and National in the USSR and After," in *Soviet and Post-Soviet Identities*, Mark Bassin and Catriona Kelly, Eds, (New York: Cambridge University Press, 2012), pp. 17-36.

[159] Ibid. 25.

[160] Ibid.

of Soviet policies and practices, yet he asserts that many citizens experienced an emotional bond through which "millions of people felt attachment to the Soviet Union, ready to defend it, die and kill for it, and embrace it as *Rodina* (Motherland)." [161] Additionally, Suny argues that the creation of this affective community decisively sets the Soviet Union apart from the tsarist empire. A major point supporting his position relates to the distance and foreignness that historically set the tsar apart from the vast majority of the Russian and non-Russian populations, as the tsars throughout the Russian Empire's history generally would not have seen a need to forge a particularly emotive attachment to the empire among all the masses beyond a sense of mystified awe and submission as the tsars' power was one which was "sanctioned by claims to divine favor and dynastic legacy."[162]

Nationalism vs. proletarian internationalism in the formation of Soviet identities

Observers have commented on the complex and sometimes paradoxical implications of the Soviet Union's policy of privileging nationality as a meaningful, though essentialized, category that would help integrate formerly colonized, non-Russian groups into a new kind of egalitarian, yet multinational, socialist state, even while aiming, as an abstract, long-term goal, for the state's "evolution" beyond national and ethnic distinctions to a utopian stage in which the proletarian identity would finally be the only meaningful

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[161] Ibid. 23.

[162] Ibid. 21.

identity.[163] As Suny points out, this policy, put into practice through such compulsory means as the dual identity categories on Soviet passports, had the effect of requiring citizens to perform what historian Francine Hirsch has termed "double assimilation"—that is, living up to their particular officially ascribed ethno-national category as well as the greater, unified Soviet identity.[164] As historian Yuri Slezkine eloquently articulated in his in-depth discussion of the Soviet Union's institutionalization of ethnic particularism, the nationalization-to-denationalization vision was riddled with such contradictions.[165] However, as Hirsch notes, the Soviet Union faced uncharted territory as it ventured into a completely new and unprecedented kind of state and society.[166] If any similar attempt to dismantle an empire and institutionalize egalitarian relationships among the "oppressed nations," (i.e., Russia's former colonies) along with the "oppressor nation" (i.e., the former Russian Empire) into a unified, modern, socialist country had ever been undertaken anywhere before, it had not been documented. In this sense, in order to more carefully understand the rationale and process of such a project, it is worth appreciating that Soviet leaders had little at their disposal in terms of lessons to draw from history at that time.

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[163] Hirsch, *Empire of Nations*; Iğmen, *Speaking Soviet with an Accent*; Suny, *The Soviet Experiment*; Tlostanova and Mignolo, *Learning to Unlearn*.

[164] Francine Hirsch, "Toward an Empire of Nations: Border-Making and the Formation of Soviet National Identities." *Russian Review* 59(2), April 2000: 201-226, p. 204.

[165] Yuri Slezkine, "The USSR as a Communal Apartment, Or how a Socialist State Promoted Ethnic Particularism." *Slavic Review*, 53(2) 1994: 414-452.

[166] Hirsch, "Toward an Empire of Nations."

On the other hand, as postcolonial theorists Madina Tlostanova and Walter Mignolo have criticized at length about the contradictions in Soviet anti-imperialist discourse, the influence of Western European historical examples of modern empire-building is evident in the pervasiveness of teleological terms within which Soviet narratives were often anchored, such as the condescending classification of some nations as more or less "cultured" or "backwards" which accordingly required a more intrusive administrative approach to the development of their national identities. Slezkine, for example, points out the case of a number of "primitive tribes" in Siberia for whom a special government was prescribed as a result of their widely dispersed settlements and being "unable to run their own affairs." [167] Such teleological narratives framing the construction of national identities were particularly common and relatively unchallenged during the early twentieth century in the United States and Europe; as postcolonial scholars point out, Marx and Engels themselves invoked teleological ideas based on Eurocentric constructions of certain stages of development that were a necessary process towards a proletarian revolt against capitalism.[168] To the credit of a number of Soviet planners, as Hirsch notes, they noticed and questioned the "similarities between the economic and political practices of the Soviet regime and those of other modernizing empires." [169] However, Lenin and Stalin's determination to follow through with "nation-

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[167] Slezkine, "The USSR as a Communal Apartment," p. 421.

[168] Tlostanova and Mignolo, Learning to Unlearn; Iğmen, Speaking Soviet with an Accent.

[169] Hirsch, "Toward an Empire of Nations," p. 203

building" as a necessary step towards a "socialist union of denationalized peoples," proved impermeable to critiques from their contemporaries.[170]

Among the paradoxical results of this policy of nation-building as a transitional stage towards "denationalization" is that the process itself reified concepts of national, racial/ethnic, and linguistic difference. As Per Anders Rudling has shown, Soviet anthropologists embraced the "science" of racial biology in order to help the Soviet state fulfill its goal of constructing, mapping, and creating an inventory of official ethnic and national identifiers, substantiated by scientific expertise.[171] In this way, knowingly or not, Soviet scientists in the 1920s collaborated with eugenicists harboring racist and social Darwinist views, allowing them influential positions within a society which ostensibly held its denunciation of racism and fascism as one of its founding principles.[172] Given that proponents of any one of a variety of fascist or xenophobic views have often invoked eugenics in order to legitimatize their ideas regarding racial and ethnic hierarchical classification,[173] the role of racial biology and anthropology in the Soviet nation-building project—or, as Hirsch aptly terms it, "state-sponsored evolutionism" [174]—provokes questions about what legacy it may have left behind in terms of concepts of scientifically determined racial and ethnic identities, nationalist territorial claims, the entrenchment of

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[170] Ibid. 203.

[171] Per Anders Rudling, "Eugenics and Racial Biology in Sweden and the USSR: Contacts across the Baltic Sea," *Canadian Bulletin of Medical History*, 31(1) 2014: 41-75.

[172] Ibid.

[173] Steven Selden, *Inheriting Shame: The Story of Eugenics and Racism in America*, (New York: Teachers College Press, 1999).

[174] Hirsch, "Toward an Empire of Nations," p. 205.

ongoing tensions between nations and ethnic groups, and what kinds of narratives might have become interwoven among all of these since then. Particularly in the aftermath of the Soviet Union's dissolution and the final abandonment of Lenin's vision of progressing towards the eventual transcendence above national, ethnic, and racial differences, pursuing the question of what narratives and visions have emerged to fill this rhetorical vacuum may reveal more insights regarding the Soviets' role in identity formation, even in post-Soviet landscapes.

Within this discussion of Soviet theoretical treatments of race and ethnicity and its relationship to the formation of Soviet identities, another key dimension to include relates to Soviets' criticism of deeply ingrained racism observed in American society, particularly towards African Americans.[175] The vision of an egalitarian, international unity of workers of diverse races and nationalities inspired Soviet leaders to welcome African American citizens to live and work in the Soviet Union. In *Blacks, Reds, and Russians*, linguist and scholar of Pan-African Studies, Joy Gleason Carew, examined the biographies and discourse surrounding these experiences of African American émigrés and visitors to the Soviet Union from early years to the late 1980s.[176] The accounts she shares in her monograph demonstrated that the Soviet Union offered opportunities to establish lives, to contribute skills and be appreciated in a society that was apparently free of the racial prejudice and violence that were a constant in daily life in America. For this reason, many African Americans, including public figures such as W. E. DuBois and

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[175] Joy Gleason Carew, *Blacks, Reds, and Russians: Sojourners in Search of the Soviet Promise*, (New Brunswick, NJ: Rutgers University Press, 2008); Tucker, *The Lenin Anthology*.

[176] Carew, *Blacks, Reds, and Russians*.

Langston Hughes drew upon their experiences in the Soviet Union in their defense of Soviet socialism and in their criticism of America's backward entrenchment in systemic racism.[177]

At the same time, Carew's study also demonstrates that African American émigrés were not safe from Stalinist paranoia and brutality. Yet despite such stark disappointments, she notes that even in light of the revelations of Stalinist terror, many African American self-identified communists were less likely than their White counterparts to abandon support for the Soviet Union, as they analyzed these revelations in the context of the long history of racial oppression in the United States and within Western European empires.[178] As Carew quotes David Levering Lewis's biography of W.E.B. Du Bois: "'To Du Bois, the degradation of the communist ideal in Soviet Russia was philosophically irrelevant to the expiation of sins of American democracy.'" [179] Importantly, Carew also points out that a common criticism of Soviet camaraderie and welcoming attitude towards African American émigrés is that it was a cynical propagandizing tool to garner support for the spread of Communism and to undermine the United States rather than a sincere desire to reach out across lines of racial and ethnic difference. To be sure, such accusations are not completely unfounded given the Russian Empire's historical discrimination and violent oppression of non-Russian Orthodox "others" (*inarodtsy*), the persistence of anti-Semitism throughout the Soviet period, and

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[177] Ibid.

[178] Ibid.

[179] Ibid. 203; David Levering Lewis, *W.E.B. Du Bois: The fight for equality and the American century, 1919-1963*, (New York: Henry Holt, 2000), [cited in Carew, 2008].

post-Soviet rekindling of xenophobia and racism, particularly in ultranationalist circles.[180]

It is beyond the scope of this present research to evaluate arguments and evidence concerning the sincerity of the Soviets' welcoming gestures of camaraderie and goodwill toward non-White émigrés and visitors. However, Carew's monograph exemplifies the value offered in taking notice of, and reflecting upon, the intersections of African American experiences of racial attitudes in America and in the Soviet Union, as these intertwined histories played important roles in the mutual production of both Soviet and American identities.

The Second World War and Soviet national identity formation

Scholarship on Soviet history, as well as present-day Russian political discourse and cultural practices, draw attention to the lasting importance and complexity of the role of World War II in the formation and deeply affective internalization of Soviet identities.[181] This identification with the Soviet past in the context of World War II has survived well past the dissolution of the Soviet Union—not only as a patriotic Russian national identity, but also as an enduring identity in formerly Soviet nations, now independent, as they

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[180] Marlène Laruelle, *Russian Nationalism: Imaginaries, Doctrines, and Political Battlefields*, (New York: Routledge, 2018); Marlène Laruelle, "Russian Nationalism and Ukraine," *Current History*, 113(765), 2014: 272-277; Cas Mudde, "Central and Eastern Europe," in *Racist Extremism in Central and Eastern Europe*, Cas Mudde, (Ed.), (New York: Routledge, 2005), pp. 247-264.

[181] Richard W. Thurston, "Cauldrons of Loyalty and Betrayal: Soviet Soldiers' Behavior, 1941 and 1945," in *The People's War: Responses to World War II in the Soviet Union*, Richard W. Thurston and Bernd Bonwetsch, Eds., (Chicago: University of Illinois Press, 2000), pp. 235-257; Overy, *Russia's War*; Suny, *The Soviet Experiment*.

contributed lives, land, and resources to the Red Army's war effort.[182] As Suny argues, the years 1941 to 1945, during which the Soviet Union fought against Nazi invasion, proved to be the most devastating of all tribulations experienced by the population during the Soviet period.[183]

Whereas outside observers had assumed that the Soviet Union had not made sufficient gains in industrial or military technological advancements to successfully resist the Nazi onslaught,[184] the mobilization and resilience of the Soviet population, with the exception of particularly hostile states such as Estonia, proved stronger than Adolf Hitler's will to brutalize, conquer, and colonize the Soviet Union.[185] The enduring traumatic memories of an estimated total loss of twenty-seven million military and civilian lives[186]—far surpassing the casualties of all other Allied or Axis forces in the war—the siege and slow starvation of Leningrad's population over the course of almost two and a half years,[187] economic losses amounting to approximately $128 billion,[188] are

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[182] Suny, *The Contradictions of Identity*; Weiner, *Making Sense of War*.

[183] Suny, *The Soviet Experiment*.

[184] Overy, *Russia's War*.

[185] Richard Bidlack, "Survival Strategies in Leningrad during the First Year of the Soviet-German War," in *The People's War: Responses to World War II in the Soviet Union*, Robert W. Thurston and Bernd Bonwetsch, Eds., (Chicago: University of Illinois Press, 2000), 84-107; Anna Reid, *Leningrad: The Epic Siege of World War II, 1941-1944*, (New York: Walker & Company, 2012).

[186] Overy, *Russia's War*.

[187] Reid, *Leningrad*.

[188] Suny, *The Soviet Experiment*, p. 359.

all charged with ardent emotion even within most of the former Soviet countries outside of Russia, as a testament to Soviet resilience and grit.[189]

As essential as it is to appreciate the role of the Second World War in the formation of lasting Soviet identities among Russians and non-Russians alike, there is also a need to question romanticized, homogeneous narratives of Soviet loyalty and unity. For example, throughout a variety of accounts of the Soviet experience of the war, scholars observe the not insignificant incidence of Soviet citizens, particularly in the Baltics region, the Caucasus, as well as Ukraine, expressing disillusion or hostility towards the Soviet government by supporting and even joining the invading Nazi army.[190] At the same time, the element of betrayal also worked in the opposite direction as Stalin fostered an atmosphere of extreme paranoia among his security forces exemplified by the arrest and, oftentimes, the execution of Soviet civilians and soldiers who had been freed from Nazi imprisonment yet were suspected, often based on no substantial evidence, of having collaborated with Nazi forces.[191] In this sense, the memories of the Second World War for survivors or for the families of those who were victimized this way reflect a less heroic narrative of the Soviet Union's role in the Second World War and raises questions about the unanimity in how these shared experiences are remembered as a factor in the formation of enduring Soviet identities.

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[189] Weiner, *Making Sense of War*.

[190] Thurston, "Cauldrons of Loyalty and Betrayal."

[191] Ibid.

A final point to address in terms of the significance of World War II to the formation of a Soviet identity and its corresponding narratives relates to the victory over fascism as a rallying phrase that continues to echo through present-day tributes to Red Army veterans and other contributors to the Soviet wartime effort, notably in presidential speeches commemorating the Soviet war effort on Victory Day in May of each year.[192] At face value, fascism—as an ideology that harbored xenophobic, anti-Semitic, social Darwinist, imperialist views, and opposed the egalitarian values of Communism, even while it opposed capitalism—stood in stark opposition to the Soviet Union's fundamentally emancipatory vision and socialist, anti-racist, anti-imperialist principles.[193] However, a perplexing and dark irony of the Soviet role in World War II and Stalin's passionate rhetoric condemning fascism is that, as observers across a broad range of literature agree, Stalin himself was known for expressing and enacting covertly and overtly anti-Semitic and xenophobic attitudes and policies.[194] As one example from the early years of his leadership, the campaigns of political persecution known as the Great Purges which took place during the mid- to late 1930s included a conspicuously large proportion of Jewish victims.[195] In his autobiography, Khrushchev admitted with remorse

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[192] "Transcript: Vladimir Putin's Victory Day Speech in Red Square (Posted 2014-05-09 15:28:44): Here is the Full Text of Putin's Red Square Speech." *The Washington Post*, May 09, 2014.

[193] Suny, *The Soviet Experiment*.

[194] Svetlana Boym, *The Future of Nostalgia*, (New York: Basic Books, 2001); Nikita Sergeevich Khrushchev, *Khrushchev Remembers*, (Boston: Little, Brown & Co., 1970); Carew, *Blacks, Reds, and Russians*; Overy, *Russia's War*.

[195] Khrushchev, *Khrushchev Remembers*; Suny, *The Soviet Experiment*.

that he not only had knowledge of, but also participated in, the blacklisting and targeting of Jewish citizens during Stalin's leadership.[196]

To be sure, Stalin was not the first leader in Russian history to uphold such views, as religious persecution and violent pogroms had been carried out since the early centuries of tsarist Russia.[197] However, the deep entrenchment of such attitudes within Stalin's policies and practices casts doubts on the strength of his supposed anti-fascist convictions. As anti-Semitism and xenophobia throughout Soviet societies survived the victory over fascism, the endurance of Soviet identities among current or former Jewish citizens of post-Soviet states may carry a deep emotional charge, but perhaps not necessarily a sense of total and egalitarian inclusion in Suny's concept of the Soviet affective community. In the present day, Russian officials invoke once again the rhetoric of anti-fascism in relation to the ongoing tensions with Ukraine, based on evidence of the steadily growing trend of ultra-nationalist, rightwing, fascist policies and sentiments in Ukraine.[198] However, Vladimir Putin's Victory Day speeches in the past two years, though they condemn the racism and xenophobia that fueled the worst atrocities of the Second World War, and he acknowledges the multiethnic and multinational sacrifices to the Red Army's war effort, his discourse problematically avoids addressing the existence of neo-fascist elements in Russia itself. For a nation that prides itself on its role in the

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[196] Khrushchev, *Khrushchev Remembers*.

[197] Brook, The Jews of Khazaria; Jeffrey Veidlinger, *Jewish Public Culture in the Late Russian Empire*, (Bloomington, IN: Indiana University Press, 2009).

[198] Per Anders Rudling, "The Return of the Ukrainian Far Right: The Case of VO Svoboda," in *Analyzing Fascist Discourse: European Fascism in Talk and Text*, Ruth Wodak and John E. Richardson, Eds., (New York: Routledge, 2013), 228-255.

war, in which the Soviet Union suffered the most losses and destruction and played one of the most decisive roles in ultimately defeating Nazi Germany, the reality of xenophobia and fascism's endurance in present-day Russia, threatening to gain greater traction in Russian national identities—as exemplified by one of Putin's most vocal and popular political opponents, Alexei Navalny, whose xenophobia and ultra-nationalism is well-known—carries troubling implications Laruelle 2014, 2018). [199]

Dekulakization and Stalinist landscapes of social difference

Recalling the tight grip of tsarist authority over the population, particularly in terms of sociospatial practices such as the passport system, the heavy scrutiny, and restrictions placed upon non-Russian and non-Christian groups, the empire's structurally and physically violent policies are often cited in scholarship on Russian and Soviet history as one of the main sources of overwhelming discontent among the population, eventually boiling over into unrest, the momentum of which the Bolsheviks successfully harnessed for the decisive coup d'état of the 1917 October Revolution.[200] However, the widespread discontent throughout the largely rural Russian population did not necessarily lead to wholehearted support for the Bolsheviks who rose to power.[201] Such ambivalence was mutually shared between the peasant majority of Russia and the largely urban,

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[199] Marlène Laruelle, "Alexei Navalny and Challenges in Reconciling 'Nationalism' and 'Liberalism,'" *Post-Soviet Affairs*, 30(4), 2014: 276-297; Marlène Laruelle, "Conspiracy and Alternate History in Russia: A Nationalist Equation for Success?" *Russian Review*, 71(4), 2012: 565-580; Laruelle, *Russian Nationalism*.

[200] Lynne Viola, *The Best Sons of the Fatherland: Workers in the Vanguard of Soviet Collectivization*, (New York: Oxford University Press, 1987); Sheila Fitzpatrick, *Stalin's Peasants: Resistance and Survival in the Russian Village after Collectivization*, (New York: Oxford University Press, 1995).

[201] Ibid.

intellectually-oriented Bolsheviks who formed the new governing body. On this point, the Bolsheviks had shared with other Russian intellectuals of various affiliations and political persuasions the disdain and distrust towards peasant populations as backward, irrational, and anachronistic obstacles to progress.[202] Yet, as Sheila Fitzpatrick notes, despite Bolshevik wariness towards the peasant class, the new government, under Vladimir Ilyich Lenin's leadership, understood the new nation's crucial need to support individual farmers who succeeded in producing high yields.[203] In this way, the urban Bolsheviks' distrust of the peasantry was tempered with tolerance for the "petty-bourgeois path" of *kulaks* or "rural capitalists."[204]

As the consensus of historians of all stripes might attest, Stalin's ascent to power decidedly marked a break with Lenin's tendency to compromise and meet *kulaks* halfway. In this way, Stalin's rule oversaw the production of a social landscape rife with social difference and corresponding stigmas.[205] One of the paradoxes of the Revolution and the Soviet banner heralding the creation of a classless society, of harmony between peasants and industrial workers, was the persistence and, in fact, a new deepening of class-based difference and conflict between rural and urban populations. The difference between the social stigmatization of peasants in the pre-revolutionary and post-revolutionary periods was that the broader society's power balance appeared to undergo

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[202] Sheila Fitzpatrick, *The Russian Revolution*, (New York: Oxford University Press, 1982).

[203] Ibid.

[204] Ibid. 103-104.

[205] Mervyn Matthews, *Class and Society in Soviet Russia,* (New York: Walker, 1972).

an inversion as the old tsarist order crumbled. At the same time, however, the fates of farmers and their families began a regression to de facto serfdom.[206] In the post-revolutionary period, this return to a second-class status in society was frequently attached to the constant suspicion of being "an enemy of the people."[207] Against the pride with which the Soviet Union branded itself as a bastion of social equality, peasants—the vital class of food producers—became maligned in Bolshevik discourse as a symbol of backwardness, conservatism, capitalist greed, counter-revolutionary dispositions—in short, all the obstacles that the Revolution had sought to overcome in order to make way for a future emancipated society.[208]

The stigmatization of peasants culminated in the persecution of millions of *kulaks*, or farmers who, on the basis of often arbitrary reasons, were accused of keeping more than their fair share of resources and wealth or were suspected of plotting a coup d'état.[209] Many of these peasants and their families were forcibly removed from their homes and farms throughout the Soviet Union. They were then transported to "special settlements" or forced labor camps, some of which were located within the Urals region,

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[206] Ibid.; on the concept of de facto serfdom, based on Merle Fainsod's use of the term "neo-serfdom" to describe peasants' social status in the Soviet Union: Merle Fainsod, *How Russia is Ruled*, (Cambridge, MA: Harvard University Press, 1970).

[207] Lynne Viola, *The Best Sons of the Fatherland: Workers in the Vanguard of Soviet Collectivization*, (New York: Oxford University Press, 1987).

[208] Ibid.; regarding the Bolshevik perception of peasantry as antithetical to the revolution: Matthews, *Class and Society in Soviet Russia*.

[209] Lynne Viola, *The Unknown Gulag.: The Lost World of Stalin's Special Settlements* (New York: Oxford University Press, 2007).

including what is present-day Chelyabinsk Oblast.[210] At these camps, *kulaks* were to be "rehabilitated" or—if deemed impossible to reform—executed.[211] Either way, however, many of those displaced succumbed to the severe living conditions at the labor camps sooner than later. From 1930 to 1931, of the roughly 1.8 million *kulaks* deported to labor camps for "rehabilitation," 592,089 were deported from the Urals region.[212] At the same time, as Viola's research indicates, many thousands of *kulaks* from throughout the Soviet Union were deported to camps in the Urals. Although many of these displaced citizens did not survive the experience, and a small number of survivors managed to return to their places of origin—though most likely not to their own homes and lands—it is possible that some of them remained in the regions, including the Urals, to which they had been deported.[213] The lands that were left behind as dekulakization took place were generally either consolidated with other surrounding farms into collective farms, *kolkhozy*, or converted to state farms, *sovkhozy*, to which poorer, landless peasants or former *kulaks* were placed.[214]

Apart from the second-class status in which peasants were placed throughout this process, particularly in terms of wages and compensation, their freedom to move to

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[210] Ibid.

[211] Viola, *The Unknown Gulag*.

[212] Ibid. 106.

[213] Ibid. 195.

[214] Lynne Viola, *The Best sons of the Fatherland*; Sheila Fitzpatrick, *Stalin's Peasants: Resistance and Survival in the Russian Village after Collectivization*, (New York: Oxford University Press, 1995); Matthews, *Class and Society in Soviet Russia.*

another location even temporarily was seriously limited as a result of the internal passport system revived in 1932 after having been dismantled with the old tsarist regime in 1917.[215] This system tightly controlled internal migration, as it had throughout much of Russia's tsarist era. In particular, at sites of special security concerns, such as the zone selected for the construction of the PO Mayak complex, controlling the movement of people rose to the top of the security agenda. Throughout the Soviet Union as a whole, rural-to-urban migration became virtually impossible, restricting rural populations to their assigned farms, further highlighting the parallels shared between serfdom before its abolishment in 1861 and peasants under Bolshevik rule.[216] Such evocations of the tsarist days of serfdom in Soviet society renders rural subjectivity, the immobility of rural subjects and their compulsory, permanent bond to rural landscapes as keys to understanding the Soviet reiteration of social and spatial inequality before the Atomic Age.

Breaking ground at Base 10: Establishing the construction zone for PO Mayak

Long before there materialized any amount of radionuclides of the kind associated with by-products of plutonium processing, the construction of PO Mayak found itself in conflict with the farming, fishing, and industrial communities situated in the north central region of Cheliabinsk Oblast which Soviet planners selected as the place in which to

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[215] Isaac Hourwich, "The Czar's Police," *The Socialist Review*, 8(3) Feb. 1920, pp. 138-142.

[216] Ibid.

construct the USSR's first plutonium production plant.[217] The leading planners of the construction project, known as No. 859 and No. 817 for the two reactors to be built as part of an integrated complex known as Base 10, had initially requested 1,159 hectares (4.47 square miles).[218] This total amount of land represents an aggregate of smaller parcels to be transferred under formal agreement with the collective and state farms, as well as city and village councils under whose jurisdiction these parcels of land were located.[219] A series of resolutions established by the Cheliabinsk Oblast executive committee of labor deputies formalized the agreements under which such land transfers were authorized. These agreements included provisions to compensate the collective and state farms, other industrial operations such as timber mills and fisheries, as well as residences, for the loss of land and properties, and included waivers of quotas for production as well as monetary compensation for relocations.

However, the construction project's planners began to flout agreements and the established process of obtaining formal permissions for acquiring new land use rights.[220] As Novoselov and Tolstikov's account demonstrates, the construction team ultimately took over 12,000 additional hectares (46.3 square miles) for its project, while barring the

[217] V. Novoselov and V. S. Tolstikov, *Taina "Sorokovki"*, (Yekaterinburg: Uralskiy Rabochiy, 1995).

[218] Ibid. 136.

[219] Ibid.

[220] Ibid. 136.

land's rightful user, Kyshtym Metalworks, from entry, citing the exceptional urgency and secrecy of the construction project.[221] In the context of a country still reeling from the widespread devastation of the War, the looming threat of atomic weaponry in the hands of formidable enemies, there is weight in its case for urgency. On top of this, the leading planners had not only the U.S. atomic capability to worry about in a more or less abstract sense, but Stalin's dwindling patience and increasing pressure to complete the construction of PO Mayak and produce the Soviet Union's first atomic bomb.[222]

At the same time, however, in 1947, Chelyabinsk Oblast was only beginning to stabilize its food supply.[223] Up until November of 1947, food ration cards for urban residents were still in use in order for them to purchase basic food and meals in dining rooms, and many ordinary items such as fresh fruits were still considered rare luxuries, out of reach to many.[224] The population of Chelyabinsk Oblast, as in much of the Soviet Union in those early postwar years still perched on the brink of malnutrition along with

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[221] V. Novoselov and V. S. Tolstikov, *Taina "Sorokovki"*, (Uralskiy Rabochiy, 1995), pp. 137.

[222] Ibid. 88; for English-language literature regarding Stalin's role in the accelerated pace of the Soviet atomic project see Michael D. Gordin, *Red Cloud at Dawn: Truman, Stalin, and the End of the Atomic Monopoly*, (New York: Farrar, Straus, and Giroux, 2009) and Paul R. Josephson, *Red Atom: Russia's Nuclear Power Program from Stalin to Today*, (Pittsburgh: University of Pittsburgh Press, 2005).

[223] Nicholas Ganson, *The Soviet Famine of 1946-47 in Global and Historical Perspective*, (New York: Palgrave Macmillan, 2009); Stephen G. Wheatcroft, "The Soviet Famine of 1946-1947, the Weather and Human Agency in Historical Perspective", *Europe-Asia Studies*, 64(6) 2012, pp. 987-1005; For further reading on food shortage in the Soviet Union during the Second World War, the impacts of which were still affecting public health and welfare in 1947, see William Moskoff, *The Bread of Affliction: The Food Supply in the USSR during World War II*, (New York: Cambridge University Press, 1990).

[224] Ganson, *The Soviet Famine of 1946-1947*.

the health risks that accompany food insecurity and unsanitary living conditions.[225] Therefore, taking any land out of production would necessarily translate into impacts that would not be easily assimilated by producers and consumers. Official records from local governing committees indicate that a significant portion of the land transferred or taken by the construction project was considered arable and productive agricultural land. One example of such cases of loss of access to productive land is found among archival documents held at the United State Archives of Chelyabinsk oblast (OGAChO) which include Resolution No. 18 by the Kuznetskiy District Executive Committee Council of Workers' Deputies, dated 26 May 1947.[226] The resolution includes formal agreements regarding partial transfers of land from the *Red Ray*, *1st of May*, and *Volunteer* collective farms, as well as a local timber mill and farming land reserve enterprise to Construction No. 859 for temporary use. The three collective farms combined conceded to an agreement to transfer a total of 1,294.45 hectares of land—approximately 5 square miles—of land, which included a total of 826 hectares of land described as "arable."[227] In this way, roughly sixty-four percent of the land transfer would result in a temporary loss of access to arable land. The date at which the land would be returned to the collective farms was not specified. Additionally, the third of four clauses, which outline a set of actions to be executed upon passing the resolution, appears to anticipate aggressions from

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[225] Brown, *Plutopia*.

[226] OGAChO, *Fond* R-274, *opis'* 20, *delo* 19, p. 112; Kuznetskiy *rayon* [*rayon* in this context refers to an administrative district at a municipal or county level] encompassed part of the land that became part of PO Mayak's territory.

[227] Ibid.

the construction project against farms, as it spells out the need to allow the *Red Ray* collective farm to carry out agricultural work:

> Send a request to the Chelyabinsk Oblast executive committee to issue an order for Construction No. 859 to not impede *Red Ray* collective farm from carrying out harvests and cultivation on 120 hectares of land that are wedged among the land parcels within the project zone's boundaries, but for which permission of use has not currently been transferred.[228]

This particular order hints at the wide economic impact of the construction project's lawless land grab upon not only farm workers and factory workers whose livelihoods depended on this land, but also local businesses and consumers who relied on their products.[229] For the workforce of collective and state farms, fisheries, and other industrial enterprises, the impact of losing already meager income as a result of the unexpected and sudden loss of access to their lands and work sites would have acutely felt. Apart from the problems created by the construction project planners' land grab, it also demonstrated a certain corruption of power and the ease with which regulations and formal agreements could be flouted by those who considered themselves authorized to do so, as the No. 859 and No. 817 construction project planners exploited the leverage they held even over regional soviets (councils) not affiliated with the state security apparatus. In this way, this event in Soviet history reflects a society defined by steep power inequalities which were starkly manifested in conflicts over control of land.

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[228] Ibid.

[229] Novoselov and Tolstikov, *Taina "Sorokovki"*.

The creation of "a state within a state": establishing the special security regime zone

As historians Novoselov and Tolstikov noted in their detailed accounting of the history of PO Mayak and the closed security regime zone, the visit of the head of the NKVD, Lavrenti Beria, to Base 10 to monitor progress of Construction No. 817 and 856 impressed upon him the need for drastic measures to ramp up security in order to render it impenetrable to potential infiltrators, spies, and otherwise problematic elements, who raised the risk of a sabotage of the Soviet atomic project.[230] Such elements ostensibly posed a direct threat to national security, for which reason Beria perceived the need to establish a highly guarded "special regime" zone covering not only Base 10, but a buffer zone of approximately 30 miles in all directions from Base 10.[231]

The Cheliabinsk oblast' executive committee approved and implemented the order on October 14, 1947, in addition to a draft defining the rights and responsibilities of residents within the zone, a list detailing each of the 99 cities, towns, and villages to be included within the zone, and tables displaying preliminary data about the populations living within the regional districts the fell within the zone.[232]

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[230] Ibid. 135.

[231] Ibid.

[232] OGAChO. *Fond* R-274, *opis'* 20, *delo* 20, pp. 1-5.

Establishing strict rules for residents of the special security regime zone

The list of rights and responsibilities repeatedly underscores the primary importance of accounting for each resident age 16 and older rendering them trackable through the mandatory system of passports and registration.[233] The implementation of this system meant that no one from the outside was permitted to enter even temporarily without having a special permit issued and registering each entry and exit with local police.[234] In the same way, residents themselves were not allowed to leave the zone without officially registering their exit with local authorities, with the exception of business trips lasting thirty days or less to local institutions within the oblast.[235] The only exception made for the requirement to register at the beginning of a temporary stay in the zone applied to leading oblast, district officials and Party-affiliated staff in leading positions who carried certified documents of their business-related travel into the special security regime zone.[236] As the boundaries of the special security regime zone cut across landscapes that included wooded areas rich with diverse flora and fauna, frequented by locals for hunting, fishing, as well as foraging for various fruits, mushrooms and other sources of nutrition growing in these areas, these activities were all explicitly forbidden to anyone

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[233] Ibid.

[234] Ibid.

[235] Ibid.

[236] Ibid.

not a resident of the special security regime zone.[237] In quantitative terms, approximately three percent of the total existing population within the zone was to be evicted and relocated as far from the zone as possible. The two largest cities in the province, Cheliabinsk and Magnitogorsk, were listed among the destinations which were designated as being off-limits to evictees from the special security regime zone. Additionally, the cities of Kyshtym, Ufalei, and Karabash were also explicitly noted in the order as not permitted as possible places to which the evicted residents could relocate. Such limitations would have posed potentially serious hardships for evicted residents by limiting their options in seeking residence outside the special security regime zone, thereby limiting their economic opportunities as cities such as Cheliabinsk and Magnitogorsk would have offered the most opportunities and resources.

The holdings at OGAChO include official documents concerning the regional implementation of Beria's orders to establish a special security security regime zone include tabulated data regarding the groups of residents deemed as security risks and slated for eviction from the zone. Among these documents are included tables that tally the numbers of evictees from each local district within the zone, and include tallies based on age group categories (Under 16 years, 16-50 years, Over 50 years), social class

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[237] Ibid.

categories (Manual Laborers, Non-manual employees, Collective farm workers, and Other), and categories of individuals with criminal backgrounds or special legal status.[238] This last table categorizes such individuals under the following headings: Convicted under Article 58 of Criminal Code of the RSFSR (refers to political prisoners who were found guilty of "counter-revolutionary" activity), Convicted under Article 59 of Criminal Code of the RSFSR (refers to crimes considered "especially dangerous" to the Soviet Union's administrative order), Convicted for a felony, Repatriated, Special settler, Former *kulak*, and Red Army soldiers taken as prisoners of war.[239] A total of 1,161 individuals are tallied in this table, with the largest portion (24.5 percent) of individuals categorized as "special settlers."[240]

Deportation and exile: rural subjects as targets for social discipline

At approximately the same time in the summer of 1948, as the director of the NKVD as well as security for the construction of PO Mayak, Lavrentiy Beria, established a special security regime zone from which to evict certain residents, a broader scale program of deportations was taking place throughout the Soviet Union. With particular relevance for

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[238] OGAChO, *Fond* R-274, *opis'* 20, *delo* 18, p. 200

[239] Ibid.; for definition of Articles 58 and 59 of the Criminal Code of the RSFSR see "The Chargé in the Soviet Union (Durbrow) to the Secretary of State, 861.00/5–3047: Telegram." *Foreign Relations of the United States, 1947, Eastern Europe; The Soviet Union, Volume IV*. Office of the Historian. history.state.gov/historicaldocuments/frus1947v04/d390.

[240] OGAChO, *Fond* R-274, *opis'* 20, *delo* 18, p. 200

the rural populations of the Southern Urals, the Presidium of the Supreme Soviet of the USSR issued the decree of 2 June 1948, titled "On exiling to remote regions those individuals who deliberately avoid labor activity in agriculture at collective farms, leading an anti-social, parasitic way of life."[241] The implementation of this decree allowed for collective farms to accuse any given member of the collective of shirking tasks and behaving as a "social parasite."[242] Members of the collective farm would then cast votes on whether or not the accused individual should be deported, and based on the results, the local village or district council held the final word on whether or not the accused would be deported, and if so, where he or she would be deported to.[243] As specified in the title of the decree, individuals found guilty of this charge were deported to collective farms or labor camps located deep in Siberia, Central Asia, or in the Far East region of the Soviet Union. From these remote corners, the decree allowed deportees to petition, after five years, to have the case reconsidered and be returned back to his or her previous residence.[244]

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[241] Sheila Fitzpatrick, "Social parasites: How tramps, idle youth, and busy entrepreneurs impeded the Soviet march to communism", *Cahiers du monde russe*, 47(1-2) January-June 2006, pp. 377-408.

[242] Ibid. 381.

[243] Ibid.

[244] Ibid.

As historian Sheila Fitzpatrick notes, more than 33,000 citizens were deported from their collective farms under this decree over the period of seven years from 1948 to 1953.[245] Archival holdings in Cheliabinsk include petitions from collective farm workers who were deported from the province in 1948, and requested to have their cases reconsidered.[246] Each petition invariably describes harsh conditions and ailing health as a primary factory in making the case to be returned back home to their original collective farm.[247] In one case, a 1952 petition sent by a woman who had been deported to the Irkutsk region in Siberia wrote of giving birth to a child while living on the new collective farm, and described both her child's and her own health deterioration as a result of conditions on the farm.[248] However, her petition was rejected on the basis of not having yet reached the five year minimum of time served in exile.[249] Other petitions frequently mention situations of injustice in relation to the original accusation which led to their deportations. For example, one deportee explains that the original accusation of avoiding work at his collective farm did not take into consideration that he was a decorated veteran who suffered debilitating injuries during the war, rendering him unable to carry out some of the tasks he was assigned on the farm.[250] Another petition from a deported collective farm worker states that she was accused based on a personal grudge

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[245] Ibid. 380-381.

[246] OGAChO, *Fond* R-274, *opis'* 20, *delo* 21, p.41-50.

[247] Ibid.

[248] Ibid. 44-45.

[249] Ibid.

[250] Ibid. 49.

from the chair of the collective farm assembly, rather than her work history.[251] Some of these petitions succeeded in winning the case to be returned from exile while others failed, but the petitions themselves all testify to the arbitrary nature of this program of social discipline. For rural communities, such practices exacerbated the physically and socially oppressive conditions of everyday life as depicted in these personal testimonies.

[251] Ibid. 50.

Chapter IV: UN-ACCIDENTAL EXPOSURE AND THE PRODUCTION OF CONTAMINATED SPACE

Knowledge about the effects of radioactive contamination upon living organisms has covered vast ground since 1945 when anthropogenic sources of radioactive isotopes developed for nuclear weaponry began to be emitted into the biosphere.[252] When PO Mayak began operation in the late 1940s, existing data relating to how anthropogenic sources of radioactive isotopes affect the environment and living organisms were relatively limited.[253] Newer than the science which created the first atomic bomb, radiation science in the context of health risks was still emerging in the early postwar years as a new frontier in ecology and medicine.[254] At the time, much of what was known was either based on laboratory studies performed on non-human animals or on studies using survivors of the atomic and hydrogen bombs dropped on Hiroshima and Nagasaki in 1945.[255] On top of the scarcity of data, the secrecy with which much of it was guarded

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[252] July 16, 1945, Trinity test site in New Mexico where the detonation of the first atomic bomb took place. Richard Rhodes, *The Making of the Atomic Bomb.* (New York: Touchstone, 1986)

[253] J. Samuel Walker, *Permissible Dose: A History of Radiation Protection in the Twentieth Century*, (Berkeley: University of California Press, 2000); E. Jerry Jesse, "A Heightened Controversy: Nuclear Weapons Testing, Radioactive Tracers, and the Dynamic Stratosphere," in *Toxic Airs: Body, Place, Planet in Historical Perspective*, James Rodger Fleming and Ann Johnson (Eds.), (Pittsburgh: University of Pittsburgh Press, 2014), pp. 152-180.

[254] Ibid.

[255] Health Physics Society, "Fact Sheet: Radiation Exposure and Pregnancy." Website. Adopted June 2010; updated June 2017; accessed September 2017; Jeffrey L. Roberg, *Soviet Science under Control: Struggle for Influence*, (London: Macmillan Press Ltd., 1998); M. Susan Lindee, *Suffering Made Real: American Science and the Survivors at Hiroshima*, (Chicago: University of Chicago Press, 1994); John Beatty, "Genetics in the atomic age: the Atomic Bomb Casualty Commission, 1947-1956," in *The Expansion of American biology*, Keith R. Benson, Jane Maienschein, Ronald Rainger, Eds., (New Brunswick: Rutgers University Press, 1991), pp. 284-324; D. R. Kagirov, "Atomnoye zarazheniye Yuzhnogo Urala: intsidenty i ustraneniye ikh posledstviy (1940-1970e gody)," [English translation: Atomic

in the U.S. posed another barrier in spite of the ease with which espionage circumvented security measures.[256] Yet the growing number of official and unofficial accounts of PO Mayak's history makes clear that by the time it began operation, scientific research had established sufficient knowledge to justify greater caution than that which was applied towards the potential collision between national security and public health in the Southern Urals.[257]

Overview of the main biophysical pathways of radioactive contamination for Techa River Valley residents

During the period of time when the most harmful levels of radiation exposure occurred in the Southern Urals, the waste products of the plutonium production process at PO Mayak formed the source of radiation.[258] The literature covering the history of PO Mayak and its contamination of surrounding landscapes makes note of the three interrelated ways in which contamination occurred.

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contamination of the Southern Urals: incidents and the remediation of their impacts], in *Vestnik Chelyabinskogo gosudarstvennogo universiteta*, №12 (303). 2013. Istoriya. Vyp. 55. C. 48-52.

[256] Michael D. Gordin, *Red Cloud at Dawn: Truman, Stalin, and the End of the Atomic Monopoly*, (New York: Farrar, Strauss, and Giroux, 2009); Thomas B. Cochran, Robert S. Norris, and Oleg A. Bukharin, *Making the Russian Bomb: From Stalin to Yeltsin*, (Boulder, CO: Westview Press, 1995).

[257] A. V. Akleyev, *Cheliabinskaia oblast': likvidatsiia posledstvii radiatsionnykh* avarii, (Chelyabinsk: Iuzhno-Ural'skoye knizhnoe izdatel'stvo, 2006); Garb and Komarova, "Victims of 'friendly fire' at Russia's nuclear weapons sites"; Brown, *Plutopia.*

[258] Nadezhda Kutepova and Olga Tsepilova, "Closed city, open disaster," in *Cultures of Contamination: Legacies of Pollution in Russia and the U.S*, Series: *Research in Social Problems and Public Policy*, Volume 14, Michael R. Edelstein, Maria Tysiachniouk, Lyudmila V. Smirnova, eds., (Bingley, UK: Emerald Group Publishing, Ltd., 2007), pp. 147-164; Natalia Mironova, Maria Tysiachniouk, and Jonathan Reisman, "The most contaminated place on Earth: Community response to long-term radiological disaster in Russia's Southern Urals," in *Cultures of Contamination*, pp. 165-183; Albert Donnay et al., "Russia and the territories of the Former Soviet Union," in *Nuclear Wastelands A Global Guide to Nuclear Weapons Production and Its Health and Environmental Effects*, Arjun Makhijani, Howard Hu, Katherine Yih, Eds., (Cambridge: MIT Press, 1995), pp. 285-392; Akleyev, *Cheliabinskaia oblast'*.

First, the Techa River contamination involved the repeated release of radioactive wastes directly into the Techa River, especially from 1949 to 1956.[259] Second, the 1957 explosion, often referred to as "Kyshtym-57" for its proximity to the city of Kyshtym, occurred as a result of a malfunctioning waste storage tank at PO Mayak which released 70-80 tons of radioactive material into the atmosphere and 20 million curies of radioactivity. (For comparison, the 1986 Chernobyl accident released 50 million curies.)[260] Third, in 1967, the Lake Karachai reservoir system of radioactive waste storage was the source of accidental release of windborne radioactive dust from the lake's dried lake beds in addition to the ongoing contamination of local wells as a result of radioactive waste buried in Lake Karachai seeping through to the groundwater table.[261] The practice of discarding mid- to high-level radioactive wastes in this natural lake had developed as part of PO Mayak's solution to eliminating the practice of releasing these high radioactive materials into the Techa River.[262]

The first and mainly technical point to note about this set of three major contamination pathways is that they arose from the large volume of highly radioactive by-products necessarily created as part of the plutonium production process, as well as

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[259] Ibid.

[260] Nikolai Egorov, Vladimir M. Novikov, Frank L. Parker, and Victor K. Popov, *The Radiation Legacy of the Soviet Nuclear Complex: An Analytical Overview*, (London: Routledge, 2016), pp. 150-153; Kutepova and Tsepilova, "Closed city, open disaster"; Mironova et al., "The most contaminated place on Earth."

[261] Kutepova and Tsepilova, "Closed city, open disaster"; Mironova et al., "The most contaminated place on Earth."; Donnay et al., "Russia and the territories of the Former Soviet Union"; John M. Whiteley, "The compelling realities at Mayak," in *Critical Masses: Citizens, Nuclear Weapons Production, and Environmental Destruction in the United States and Russia*, (Cambridge: MIT Press, 1995).

[262] Ibid.

the complex and unprecedented engineering challenge of ensuring the safe management of these highly volatile and radioactive substances.[263] In addition, the question of how to handle radioactive waste is further complicated by their longevity. For example, the most common radionuclides which emit ionizing radiation in all of these cases are Strontium-90, which has a half-life of 28.8 years, and 137-Cesium which has a half-life of 30.2 years.

The second point to note is that the far-reaching and long-term sociospatial impacts shared by each these contamination events and processes and which contributed to their interconnected complexity relates to their direct, life-changing consequences upon numerous civilian populations whose rural and often subsistence-based lifestyles had depended directly upon their surrounding natural resources which became contaminated.[264] As a result of their geographic locations and proximity to PO Mayak and the downstream, downwind, and subterranean paths of radionuclides carried by river, air, groundwater, and agricultural food products, many residents of villages and towns faced debilitating health conditions, higher mortality rates, and social and economic disruption, either as a result of evacuation and relocation or the sharply reduced access to clean water and land.[265]

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[263] Egorov et al., *The Radiation Legacy of the Soviet Nuclear Complex*; Brown, *Plutopia*; Gordin, *Red Cloud at Dawn*.

[264] Michael R. Edelstein and Maria Tysiachniouk, "Psycho-social consequences due to radioactive contamination in the Techa River region of Russia," in *Cultures of Contamination*, pp. 185-204; Kutepova and Tsepilova, "Closed city, open disaster"; Mironova et al., "The most contaminated place on Earth."; Paula Garb and Galina Komarova, "Victims of 'Friendly Fire'"; Komarova, "Muslyumovo Syndrome."

[265] Akleyev, *Cheliabinskaia oblast'*.

The third point regarding these pathways of contamination takes on a broader, more sociopolitical character in that state and institutional response to the resulting health, social, and economic crises was complicated by a mandate of secrecy based on the geopolitically defined priority of national security.[266] As a result, for nearly forty years, the vast majority of residents affected by contamination could not know the underlying cause of their unusual health conditions or the real reason as to why contact with the Techa River was prohibited or why evacuations and relocations were being ordered for some communities but not others.

The Techa River contamination

Numerous historical accounts of PO Mayak's repeated releases of radioactive wastes into the Techa River make note of the social and political context within which these practices took place.[267] In particular, the United States' show of deadly force using a new level of military technology in August of 1945, devastating thousands of innocent civilians in a matter of moments, drove home for the Soviet Union the concrete threat of an attack by the United States.[268] In this way, the post-World War II developments on the geopolitical stage heightened the Soviet Union's sense of urgency to build up its own nuclear arsenal.[269] Given the limited resources available as the Soviet Union struggled to recover

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[266] Edelstein and Tysiachniouk, "Psycho-social consequences due to radioactive contamination"; Kutepova and Tsepilova, "Closed city, open disaster"; Mironova et al., "The most contaminated place on Earth."; Paula Garb and Galina Komarova, "Victims of 'Friendly Fire'"; Novoselov and V. S. Tolstikov, *Taina "Sorokovki"*.

[267] Novoselov and Tolstikov, *Taina "Sorokovki";* Kagirov, "Atomnoye zarazheniye Yuzhnogo Urala"; Brown, *Plutopia*; Cochran et al., *Making the Russian Bomb*; Josephson, *Red Atom*.

[268] Cochran et al., *Making the Russian Bomb*.

from the economic devastation of defending itself from the Nazi invasion during the war, these limited resources were singularly focused on uranium processing and plutonium extraction, while the question of waste management was sidelined.[270]

To expedite the plan to build the Soviet Union's own "nuclear shield," Soviet scientists and engineers relied heavily on information obtained via espionage within the atomic program in the United States.[271] In particular, historians note that the Hanford Reservation served as an important model for the construction of PO Mayak.[272] The use of Hanford as a model is particularly significant in considering the practice of releasing radioactive wastes into the Techa River as the Columbia River of Washington state was used in a similar manner.[273] However, the more shallow hydrography and slower drainage rate of the Techa River watershed renders it much more vulnerable to accumulating toxins than the Columbia River.[274] Therefore, the total 2.75 million curies (Ci) of radioactivity released into the Techa River from 1949 to 1956 had a greater potential to linger undiluted and in close proximity to downstream villages and towns

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[269] Novoselov and Tolstikov, *Taina "Sorokovki."*

[270] Kutepova and Tsepilova, "Closed city, open disaster"; Mironova et al., "The most contaminated place on Earth"; Brown, *Plutopia*.

[271] Cochran et al., *Making the Russian Bomb*.

[272] Ibid.; Whiteley, "The compelling realities at Mayak"; Donnay et al., "Russia and the territories of the Former Soviet Union"; Brown, *Plutopia*.

[273] Whiteley, "The compelling realities at Mayak"; Brown, *Plutopia*.

[274] Kutepova and Tsepilova, "Closed city, open disaster"; Mironova et al., "The most contaminated place on Earth."

situated by the river.[275] While scientists, historians, and observers agree that most of the highly radioactive releases into the Techa River took place from 1949 to the end of 1951, by that point, riverside populations had already been exposed to excessively high levels of radiation and had begun to experience serious health problems.[276] In total, approximately 124,000 residents were exposed to radiation throughout the Techa River watershed along approximately five hundred miles downstream from PO Mayak, and an estimated 24,000 residents received a harmful dose of radiation.[277]

Kyshtym-57

In response to the health crisis created by the practice of releasing radioactive wastes into the Techa River, PO Mayak authorities drew up plans to discontinue the release of high-level radioactive substances into the river by finding alternatives to waste management.[278] One of these waste management alternatives involved constructing underground tanks which were designated to store the most highly radioactive and volatile waste. However, as historian Kagarov points out, the equipment installed to regulate and monitor conditions within the tanks failed, leading the dangerously high temperature spike in one particular tank to go unnoticed by staff on September 29, 1957.[279] The rising heat in this

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[275] Ibid.; Whiteley, "The compelling realities at Mayak"; Egorov et al., *The Radiation Legacy of the Soviet Nuclear Complex*.

[276] Kutepova and Tsepilova, "Closed city, open disaster"; Mironova et al., "The most contaminated place on Earth"; Akleyev, *Cheliabinskaia oblast'*.

[277] Ibid.

[278] Whiteley, "The compelling realities at Mayak"; Egorov et al., *The Radiation Legacy of the Soviet Nuclear Complex*.

[279] Kagirov, "Atomnoye zarazheniye Yuzhnogo Urala."

single tank reached a critical point on that date, resulting in an explosion that released seventy to eighty tons of radioactive material containing twenty million curies of radiation into the atmosphere.[280]

Kyshtym-57's resulting fallout zone, also known as the East Ural Radioactive Trace (EURT), was estimated as covering 23,000 square km (approximately 8,990 square miles, or 2.5 times the area of Yellowstone National Park).[281] Following the wind current direction at the time, the EURT lies in a northeastern direction from PO Mayak and continues well into Sverdlovsk and Tyumen provinces, both of which lie north and northeast of Chelyabinsk Oblast. The resulting contamination is largely due to the presence of Strontium-90.[282] As Mironova et al. note, approximately 373,000 residents were exposed to at least significant levels of radiation, including radionuclides carried by multiple rivers and lakes that lie within the EURT.[283] For the city of Ozyorsk, located just north of PO Mayak, it is essentially only by chance that this town of about 100,000, where PO Mayak workers and their families live, avoided the EURT, as the town lies west of the fallout.[284]

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[280] Ibid.; Whiteley, "The compelling realities at Mayak."

[281] Kutepova and Tsepilova, "Closed city, open disaster"; Mironova et al., "The most contaminated place on Earth"; Kagirov, "Atomnoye zarazheniye Yuzhnogo Urala"; Akleyev, *Cheliabinskaia oblast'*.

[282] Kutepova and Tsepilova, "Closed city, open disaster," p. 153; Whiteley, "The compelling realities at Mayak"; Egorov et al., *The Radiation Legacy of the Soviet Nuclear Complex*.

[283] Mironova et al., "The most contaminated place on Earth," p. 169.

[284] Kutepova and Tsepilova, "Closed city, open disaster," p.154.

Lake Karachai reservoir system of radioactive waste storage

In addition to the construction of underground storage tanks intended to hold high-level radioactive wastes after the disastrous consequence of releasing these into the Techa River was discovered in 1951, PO Mayak authorities additionally designated a nearby natural lake, Lake Karachai, as a reservoir to hold medium-level radioactive wastes. Additionally, PO Mayak engineers constructed a system of additional reservoirs and canals in order for Lake Karachai to be able to hold more volume of liquid waste, while more efficiently diverting the more highly radioactive waste away from the Techa River.[285] Over time, the reservoir accumulated approximately 120 million curies of radioactive material.[286]

In April of 1967, an unusually dry winter and early spring weather resulted in very low water levels which exposed 45 hectares or about 111 acres of dry lakebed covered in layers of radioactive sediments accumulated throughout almost twenty years.[287] As spring in the Southern Urals normally brings high winds, the dust from these exposed lakebeds was lifted and across a similar northeastern path as the EURT. As a result, approximately 600 curies of radioactive aerosols were dispersed and deposited by

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[285] Ibid.; Whiteley, "The compelling realities at Mayak"; Donnay et al., "Russia and the territories of the Former Soviet Union."

[286] Kutepova and Tsepilova, "Closed city, open disaster."

[287] Kutepova and Tsepilova, "Closed city, open disaster," p. 154; Whiteley, "The compelling realities at Mayak," p. 79-80; Donnay et al., "Russia and the territories of the Former Soviet Union," p. 333.

the wind over nearby villages, some of which had received evacuees from the previous crises.[288]

An additional risk inherent in the use of Lake Karachai as a reservoir to hold radioactive waste lay in the possibility of a flood event occurring with a dam failure, which would then result in the flooding of Muslyumovo, the only town left in close enough to PO Mayak to potentially be affected by such a flood.[289] It was not until 2015 that PO Mayak completed the work of filling and paving over with concrete the last of the Lake Karachai reservoirs in order to finally eliminate this risk.[290]

However, one last source of contamination in connection with Lake Karachai which has still not been resolved relates to the groundwater contamination from the radioactive material seeping from the lake bottom.[291] Wells in local villages have been found to contain contaminated water as a result.[292]

State and institutional policies and actions to protect the population

In 1951 Soviet state scientists began taking measurements of radioactivity levels in the region surrounding PO Mayak and discovered that levels of radioactivity in soils and organic tissues of animals were so high to the point of having become harmful sources of

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[288] Ibid.

[289] Kutepova and Tsepilova, "Closed city, open disaster."

[290] "Russia Completes Remediation of Radioactive Lake Karachai." *Progressive Digital Media Oil & Gas, Mining, Power, CleanTech and Renewable Energy News*, Nov 04, 2015.

[291] Ibid.; B. F. Myasoedov, S. N. Kalmykov, Yu. M. Kulyako, and S. E. Vinokurov, "Nuclear Fuel Cycle and Its Impact on the Environment," *Geochemistry International*, 2016, 54(13), pp. 1156–1167.

[292] Ibid.

radiation.[293] In June of that year, the Ministry of Health sent a brigade of scientists from the Institute of Biophysics to conduct specialized medical examinations of riverside residents.[294] Their measurements of radioactivity showed that residents living closest to site of discharge had received radiation doses which exceeded the safe level of radiation for a human to receive over a lifetime.[295] In September 1951, PO Mayak began implementing changes in waste management to avoid releasing highly radioactive wastes into the Techa River.[296] This involved using the natural lake, Lake Karachai, as a reservoir to hold medium- to high-level wastes, and constructing underground storage tanks which were designated for the most highly radioactive wastes.[297] From 1952 to 1956, state authorities began a program of evacuation and relocation whereby the villages located closest downstream from PO Mayak were evacuated and relocated to villages located further away from the river.[298] In total, 17 villages were evacuated during from 1952 to 1960.[299] However, subsequent re-testing and dosimetric readings showed that high levels of radiation exposure continued to pose a health threat to riverside

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[293] Mironova et al., "The most contaminated place on Earth"; Whiteley, "The compelling realities at Mayak."

[294] Akleyev, *Cheliabinskaia oblast'*.

[295] Ibid.

[296] Egorov et al., *The Radiation Legacy of the Soviet Nuclear Complex*; Brown, *Plutopia*.

[297] Ibid.; Donnay et al., "Russia and the territories of the Former Soviet Union"; Whiteley, "The compelling realities at Mayak."

[298] Whiteley, "The compelling realities at Mayak."

[299] Komarova, "Muslyumovo Syndrome."

communities.[300] Therefore, more villages downstream needed to be evacuated. For this reason, by 1960, 20 more villages were evacuated.[301] However, the town of Muslyumovo and Brodokalmak, both of which have large Muslim populations, were not evacuated, and questions about the reasons for leaving them in place linger in the present day.[302]

Water access and restrictions on the Techa River

In 1952, state authorities began to prohibit residents from swimming, fishing, or irrigation using the Techa River water, but drinking the water was not prohibited until 1955.[303] Such prohibitions were difficult to enforce in practice due to the lack of alternatives for drinking water and other activities such as irrigation, swimming, and fishing.[304] While signs were posted, fencing was built along the riverbanks, and security guards tried to discourage trespassing, neither residents nor the security guards were informed of the reason why the water posed a health hazard.[305] In an effort to provide a safe alternative for drinking water, the government of Chelyabinsk Oblast ordered the construction of wells for communities who remained in the Techa River Valley.[306]

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[300] Ibid.; Whiteley, "The compelling realities at Mayak."

[301] Ibid.

[302] Fauzia Bayramova, *Yaderniy arkhipelag ili genotsid protiv tatar?*, (Kazan': Izdatelstvo «Ayaz», 2005); Edelstein and Tysiachniouk, "Psycho-social consequences due to radioactive contamination in the Techa River region of Russia"; Komarova, "Muslyumovo Syndrome."

[303] Mironova et al., "The most contaminated place on Earth."

[304] Ibid.; Edelstein and Tysiachniouk, "Psycho-social consequences due to radioactive contamination in the Techa River region of Russia"; Komarova, "Muslyumovo Syndrome."

[305] Ibid.

However, as the earth becomes hardened with frost during several months in the year, the construction of these wells proceeded ineffectively.[307] In addition, well water was known for having a very poor taste in this region, which made the water from the Techa much more favorable.[308] In this way, residents habitually violated rules prohibiting the use of the river water.[309]

Kyshtym-57: the "likvidatsiya" or, the clean-up crew

PO Mayak's emergency response to the disaster included enlisting all available labor sources to assist in the clean-up effort.[310] Notably, those who received the highest dosage of radiation included the individuals who were enlisted, with the help of local government authorities, in the immediate aftermath of the explosion.[311] As historical accounts of this event point out, the clean-up labor force consisted not only of PO Mayak workers but also soldiers, prisoners, students, and civilian residents of adjacent villages including children.[312] Moreover, the lack of safety gear specialized for protection from radioactive contamination resulted in especially high dosage for this group.[313] As

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[306] Kagirov, "Atomnoye zarazheniye Yuzhnogo Urala"; Mironova et al., "The most contaminated place on Earth."
[307] Brown, *Plutopia*.
[308] Ibid.

[309] Ibid.; Mironova et al., "The most contaminated place on Earth"; Kagirov, "Atomnoye zarazheniye Yuzhnogo Urala."
[310] Edelstein and Tysiachniouk, "Psycho-social consequences due to radioactive contamination in the Techa River region of Russia"; Kagirov, "Atomnoye zarazheniye Yuzhnogo Urala"; Brown, *Plutopia*; Scott D. Monroe, "Chelyabinsk: The Evolution of Disaster," *Post-Soviet Geography*, 1992, 33(8) 533-545.

[311] Ibid.

[312] Ibid.; Novoselov and V. S. Tolstikov, *Taina "Sorokovki."*

[313] Ibid.

historian Kate Brown points out, the clean-up workers drawn from soldiers, nearby prison camps, and adjacent villages were the workers whose tasks involved the most risk of high radiation exposure, while they were the least monitored for radiation dosage.[314] The result is that there remains insufficient documentation of how many people were enlisted in the clean-up effort, what dosage of radiation they were exposed to, and what health impacts they may have experienced as a result of their exposure.[315]

Contrary to PO Mayak's official line regarding the number of fatalities resulting from the disaster, asserting simply that there were no fatalities, eyewitness accounts as well as archived testimony given by prisoners indicate otherwise.[316] As many soldiers were discharged after assisting with the clean-up, and prisoners were granted early release, their medical conditions would not have been documented and monitored.[317] As a result, Brown points out, when PO Mayak asserts that Kyshtym-57 caused no fatalities, they are basing this assertion solely on the medical records of their paid employees, while the physical conditions of the vast majority of frontline clean-up crew were apparently never officially recorded.[318]

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[314] Brown, *Plutopia*.

[315] Ibid.; Monroe, "Chelyabinsk: The Evolution of Disaster."

[316] Slawomir Grunberg, (Director, Producer), *Chelyabinsk: The Most Contaminated Spot On the Planet* [Video file]. LogTV. Retrieved from Academic Video Online: Premium database; Brown, *Plutopia*.

[317] Brown, *Plutopia*.

[318] Ibid.; Grunberg, *Chelyabinsk.*

PO Mayak scientists mapped the EURT along with the varying levels of radiation exposure within it in order to make decisions about evacuations and relocations. They determined that any territory within the EURT found to be contaminated with an average level of radioactivity exceeding 2 curies per km should not be inhabited by humans. A total of about 11,000 people lived across this territory, but no evacuations took place until at least one week after the explosion.[319] As Mironova et al point out, some residents waited for as long as two years to be evacuated and relocated.[320]

Lake Karachai: Flood risk and groundwater contamination

Following the April 1967 incident in which Lake Karachai's dried lakebed and high winds resulted in new radioactive contamination, PO Mayak engineers began to plan a process by which Lake Karachai's water level would be maintained by a system of monitors and dams.[321] In this way, its radioactive waste would no longer face the risk of repeating windborne radioactive dust storm. However, with the construction of dams containing Lake Karachai and its system of reservoirs, the risk of dam failure that could result in a radioactive flood striking Muslyumovo existed until 2015.[322] At this time, Lake Karachai and its reservoirs were filled in with concrete, eliminating the risk of dam failure and flooding. Unfortunately, this did not resolve the issue of groundwater contamination as a result of radionuclides seeping through the lake bottom and migrating

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[319] Mironova et al., "The most contaminated place on Earth"; Akleyev, *Cheliabinskaia oblast'*; Kagirov, "Atomnoye zarazheniye Yuzhnogo Urala".

[320] Mironova et al., "The most contaminated place on Earth," p. 169.

[321] Egorov et al., *The Radiation Legacy of the Soviet Nuclear Complex*.

[322] Ibid.; Kutepova and Tsepilova, "Closed city, open disaster."

through rock layers to the groundwater from which local wells derive their water supply.[323] The discovery of this mode of contamination of drinking water was discovered in 1973 and led to yet another set of evacuations and relocations for residents dependent on these contaminated wells.[324]

Long-term social impacts of living in an irradiated landscape

Socioeconomic and demographic data for years between 1996 and 2003 show population decrease across Chelyabinsk province.[325] Most notably, in Kunashak district from 1986 to 2003 the birth rate decreased by nearly 50% while the mortality rate more than doubled.[326] Furthermore, of all the districts in which radioactive contamination from PO Mayak occurred, Kunashak district saw the sharpest increase in the number of adults who had fallen ill between 1995 and 2003.[327] The increase cannot be explained by population growth as the population of Kunashak district decreased across these years. Significantly, Kunashak is the district which encompasses riverside territory that is adjacent to and downstream from PO Mayak as well as territory that is within the fallout zone from both Kyshtym-57 and the windborne radioactive dust carried from Lake Karachai's dry lakebeds in 1967.[328] Therefore, its population has directly experienced all three pathways

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[323] "Russia Completes Remediation of Radioactive Lake Karachai"; Myasoedov et al., "Nuclear Fuel Cycle and Its Impact on the Environment."

[324] Mironova et al., "The most contaminated place on Earth," p. 172.

[325] Akleyev, *Cheliabinskaia oblast'*, p. 54.

[326] Ibid. 55.

[327] Ibid. 58.

[328] Ibid.

of contamination. At the same time, it is among the most economically vulnerable districts as the population's purchasing power is among the lowest in Chelyabinsk province.[329]

The case of Kunashak district

Medical literature such as the many publications produced by preeminent Russian medical researcher, A. V. Akleyev, also makes note of the exceptionally high rate of alcoholism in Kunashak district.[330] This fact is presented in his 2006 publication in which Akleyev, along with a team of scientists, presented statistical accounts of demographic, physical, socioeconomic, and psychological characteristics in relation to populations impacted by radioactive contamination in the Techa River Valley. However, the presentation of the pattern of alcoholism in Kunashak district in the midst of demographic data showing a dying population, and appears to attempt to use the fact of high rates of alcoholism as an explanatory factor for the outcome of high mortality and ill health in this population.[331] At the same time, the discussion of alcoholism omits consideration of the district's economic vulnerability or the geographic reality which has historically placed this district in the direct path of all three major contamination events originating at PO Mayak. This subtle discursive maneuver through data, its interpretation, and how it is communicated to the public suggests yet another and less accidental

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[329] Ibid. 59.

[330] Ibid.

[331] Ibid. 59.

victimization of marginalized populations living with contaminated bodies and landscapes.

Thematic overview of "economy of secrets" and its historical impact on radioactive contamination in the Southern Urals

In this overview of what I conceptualize as an "economy of secrets," I will consider the implications of the competing moral gravities that shaped the government's response to the public health and environmental crises caused by PO Mayak's three major events of radioactive contamination. In particular, I will focus on problems centered on the social-environmental inequalities manifested throughout the history of PO Mayak in Chelyabinsk province. The first of these relates to the lack of transparency regarding the destinies of rural populations which were evacuated as well as those not evacuated from the most heavily polluted riverside villages following the discovery of severely high levels of radioactive contamination of their surrounding land and their own bodies. What explains the seemingly arbitrary decision to evacuate some villages but not others? On these points, I make note of the suspicion some ethnic Tatar Russians have brought forth in accusing the Soviet state of deliberately leaving the largely Muslim communities in harm's way while evacuating communities of which the majority were ethnic Russians.[332] The second problem I will discuss relates to the lacunae and deceptive illusions deployed by Soviet security officials as part of what I have termed the economy of secrets to hide as well as disguise places, names, terms related to nuclear production or its after effects as part of the effort to "throw the enemy off." These practices carried out in the name of

[332] Bayramova, *Yaderniy arkhipelag ili genotsid protiv tatar?*

national security continue to muddle records that are vital for citizens' own personal documents with problematic results in the effort to make claims for government compensation as victims of radiation exposure.[333] Thirdly, I will discuss particular ways in which such erasures and illusions manifested in historical records, with the effect of hampering scientific research at the time, and present-day historical research.

Un-accidental exposure: Tatar and Bashkir citizens left in harm's way

The prioritization of secrecy even in the realm of public health resulted in exposure of rural communities along the Techa River to hazardous levels of radiation for a prolonged period of years and even decades, in many cases. In the Soviet Union, those living in the vicinity of PO Mayak were unaware of what the guarded complex produced or of the extent of the health risks it posed. Adding to the perplexity of this drawn-out disaster, researchers have noted that the majority of villagers who were evacuated during those early years of the 1950s were ethnic Russian, while the majority of those who remained were of Tatar and Bashkir ethnic descent, even as the rural areas surrounding Mayak are predominantly Tatar and Bashkir.[334] The town of Muslyumovo, for example, was one such riverside community, located downstream from PO Mayak. According to Tatar historian Faiza Bayuromvoa, in 2005 in Muslyumovo, 1 in 4 children suffered from a congenital illness or condition.[335] The lack of substantive explanation for state officials'

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[333] Kutepova and Tsepilova, "Closed city, open disaster."

[334] Garb and Komarova, "Victims of 'friendly fire' at Russia's nuclear weapons sites"; Komarova, "Muslyumovo Syndrome."

[335] Bayramova, *Yaderniy arkhipelag ili genotsid protiv tatar?*, p. 31.

decisions to not evacuate the residents, allowing them instead to stay put by the contaminated river, without informing them of the contamination pervading their primary source of water, has led to the belief that they were deliberately left behind as subjects of research on the effects of radiation.[336]

Tatar activists such as Bayramova pursue this point further and accuse the state of allowing such conditions with the intent of genocide against Tatar and Bashkir ethnic groups.[337] However, most of the current scholarly literature on the history of radioactive contamination in the Techa River basin generally shares the consensus that while the suspicion exists, there is insufficient evidence to prove deliberate ethnic bias.[338] Additionally, among the documents I reviewed from the State Archives of Chelyabinsk Oblast, covering records of the executive committee of Chelyabinsk Oblast, primarily from 1946 to 1955, I encountered records from 1948, before PO Mayak even began operations, pertaining to the resettlement of residents who did not qualify to remain in the restricted zone around the territory on which PO Mayak was being constructed. These records include the nationality of each head of household, among other social markers. As in the case of Jewish citizens, Bashkir and Tatar citizens were labelled as such, effectively othering them as distinct from the ethnic Russian nationality. Yet, I did not find official documents reflecting explicit bias or aggressions against Tatar or Bashkir

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[336] Edelstein and Tysiachniouk, "Psycho-social consequences due to radioactive contamination"; Bayramova, *Yaderniy arkhipelag ili genotsid protiv tatar?*

[337] Bayramova, *Yaderniy arkhipelag ili genotsid protiv tatar?*

[338] Garb and Komarova, "Victims of 'friendly fire' at Russia's nuclear weapons sites"; Komarova, "Muslyumovo Syndrome"; Brown, *Plutopia*.

groups. One of the documents I reviewed, which outlined the committee's plan to eliminate an outbreak of cholera, included an order to produce educational materials in Bashkir to distribute among Bashkir communities. Though minimal, this reflects an official stance of inclusion in the domain of public health. However, as my review of documents relating to multiple disease outbreaks during the late 1940s and 1950s shows, the regional authorities of Chelyabinsk oblast repeatedly noted the lack of fulfillment of plans to address epidemics and other health crises, reflecting the deep challenges of turning plans typed out on paper into action and verifiable results. In this way, I do not have a means of determining how this order to provide Bashkir language health education materials played out in reality or whether or not this order was in fact carried out. Yet, while there may not be sufficient evidence to substantiate such a claim, the fact that so little information is made available to the public continues to fuel such burning questions, resentment, and mistrust of the state. What *is* borne out by data produced by medical research is that Tatar and Bashkir residents of this region disproportionately continue to experience health effects of radiation exposure.[339] Sociological research makes a strong case for the role of historical and present socioeconomic marginalization of these rural communities in exacerbating this continuing public health crisis.[340]

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[339] Akleyev, *Cheliabinskaia oblast'*.

[340] Kutepova and Tsepilova, "Closed city, open disaster"; Galina Komarova, "Ethnic and confessional aspects of the 'Maiak' accident," in *Peoples, Identities, and Regions: Spain, Russia, and the Challenges of the Multi-ethnic State*, (Moscow: Institute Ethnology and Anthropology Russian Academy of Sciences, 2015), pp. 296-324; Komarova, "Muslyumovo Syndrome"; Komarova, *Liudi i Radiatsii: Etnokul'turniye Aspekty Ekologicheskogo Bedstviya na Iuzhom Urale*, (Moskva: Institut etnologii i antropologii RAN, 1999); Komarova, "Musliumovo Syndrome".

The impact of erasures and illusions on the bureaucracy of compensation

On the issue of socioeconomic vulnerability compounded by illnesses and high mortality rates as a result of the legacy of radiation exposure, the lack of transparency in records regarding PO Mayak, its practices, as well as the special restricted zone created to secure and hide it from the public compounds the challenges facing residents seeking to establish their official status as victims of radiation exposure in order to qualify for compensation from the government.[341] As Nadezhda Kutepova and Olga Tsepilova noted, residents of the special security regime zone during the Soviet period could not display their actual place of residence on their official documents due to the fact that this zone which included not only Ozyorsk but surrounding communities as well, could not even be named in public at the time.[342] Therefore, in the post-Soviet period, the fact that such documents show a different place of residence for that time period, makes it all the more difficult for an individual to prove they lived where they claim they lived during a period of high radioactive contamination. Without evidence, their claims for compensation, meager enough as it is, has no chance to be considered.[343]

The economy of secrets: erasures and illusions

The historians V. S. Tolstikov and Victor Nikolaevich Kuznetsov, who have written numerous books and articles relating to the history of nuclear production and its social-environmental consequences in the Southern Urals, touch on the practice of using aliases

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[341] Kutepova and Tsepilova, "Closed city, open disaster."

[342] Ibid.

[343] Ibid.

and pseudo-terms for sensitive terminology, citing the 1949 establishment of the policy titled "On the means of ensuring secrecy of facilities of the First Chief Directorate under the USSR council of ministers."[344] As the authors note, this meant taking euphemisms to an entirely new level to replace sensitive or red-flag-raising terms.[345] In addition to the nondescript pseudonyms of restricted cities such as Cheliabinsk-40 as an alias for the restricted city of Ozyorsk, for example, a chemical element such as Uranium-238 became *Kremnil-1*. Plutonium-239 became *Ametil*.[346] Terms for serious medical conditions related to radiation or biohazard exposure such as *tsepnaya reaktsiya* or "septic reaction" became *okisleniye* or "oxidation". *Radioaktivnoye oblucheniye* or "radioactive radiation" became *okurivaniye*, roughly translated to "fumes." *Luchevaya bolyezniy* or "radiation sickness" became *vegetososudistaya distoniya vtoroy stepeni*, which I roughly translate as "muscle spasms to the second degree."[347] In another example of euphemistic aliases noted by researcher Susanne Bauer regarding the use of aliases to hide the real identities of places, a radio-oncology clinic which treated cancer patients with radiation syndrome in Semipalatinsk in Kazakhstan was known as a brucellosis hospital named simply "Dispensary No. 4."[348] In addition to such common use of aliases and euphemisms,

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[344] V. S. Tolstikov and V. N. Kuznetsov, *Iadernoe Nasledie na Urale: Istoricheskie Otsenki i Dokumenty*, (Yekaterinburg: Bank kul'turnoi informatsii, 2017).

[345] Ibid.

[346] Ibid. 60.

[347] Ibid.

[348] Susanne Bauer, "Radiation science after the Cold War. The politics of measurement, risk, and compensation in Kazakhstan," in *Health, Technologies, and Politics in Post-Soviet Settings: Navigating Uncertainties*, Olga Zvonareva et al. (Eds.), (Cham: Palgrave Macmillan, 2017), p. 232.

Tolstikov and Kuznetsov note the overkill extent to which Soviet officials masked even mundane things with no relation to sensitive projects.[349] This policy not only rendered historians' tasks today that much more challenging and uncertain, but even Soviet scientists pursuing research in radiation science at the time this policy was implemented also expressed frustration with the obstacles it created in the circulation and vital practice of peer-review.[350]

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[349] V. S. Tolstikov and V. N. Kuznetsov, *Iadernoe Nasledie na Urale.*

[350] Ibid.

CHAPTER V: SCIENTISTS AS SUBJECTS

Examining the role of scientists in knowledge production about the risk of radioactive contamination, I incorporate within this study a personal dimension by bringing into focus the biographies of scientists and their distinct situations as knowledge producers. The importance of such an analysis of Soviet scientists as individual subjects lies in their key roles as a restless community of knowledge producers in a society where not only was this knowledge restricted to a privileged minority, but the access to such knowledge served as the first step towards protection from the risks of radiation exposure. Therefore, I disrupt the black box in which these scientists have been traditionally placed in American and Western European historiography in order to reveal their lesser known subjectivities and how these personal narratives helped shape the landscape of unknown risk. In questioning the oversimplified portrayal of Soviet scientists, it is relevant to highlight the especially privileged status of physicists, as their value to national security objectives of nuclear weapons development allowed them much greater freedom and access to state authority than that which was within reach of ecologists and biologists.[351] This is particularly crucial to note as ecologists were among the first to raise concerns regarding potential hazards of radiation in the environment.[352] Relatedly, the shifts in philosophical foundations underlying Soviet scientific reasoning across time, most

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[351] Ethan Pollack, *Stalin and the Soviet Science Wars*, (Princeton: Princeton University Press, 2006); David Holloway, *Stalin and the Bomb: The Soviet Union and Atomic Energy, 1939-1956* ((New Haven: Yale University Press, 1994).

[352] N. F. Reimers, "Bez prava na oshibku," *Chelovek i priroda*, No. 10, (1980) 17; Douglas Weiner, "Prometheus Rechained: Ecology and Conservation," in Loren Graham (Ed.), *Science and the Soviet Social Order* (Cambridge: Harvard University Press, 1990), pp. 71-93.

notably after Stalin's death in 1953, set off key disruptions in Soviet scientific theory and practice governing knowledge production during the three decades following World War II.[353]

As the nuclear arms race became a known and tangible reality at the time that the United States dropped the first atomic bomb on a civilian population in Hiroshima, Japan in 1945, it is relevant to consider American scientists in a discussion of scientists' subjectivities in the context of the growing entanglement of science, society, public health, and the environment in the atomic age. As Ethan Pollack notes in *Stalin and the Soviet Science Wars*, Soviet scientists worked under the scrutiny of the state, facing serious threats not only to their careers but also their lives if the implications of research they produced strayed out of alignment with Stalin's particular brand of scientific Marxism.[354] At the same time, nuclear physicists, by virtue of their key role in advancing the Soviet Union towards the creation of its nuclear arsenal, benefited from a special status which afforded them more intellectual independence than scientists in other fields.[355] In addition, the main rationale for restricting the public's awareness about their exposure to radiation and the health problems resulting from radiation exposure related to what was perceived as a risk in the breach of national security.[356]

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[353] Ibid.

[354] Pollack, *Stalin and the Soviet Science Wars*.

[355] Ibid.

[356] Cochran et al., *Making the Russian Bomb*.

Aleksandr Dmitrievich Sysoev, Physical Geographer

The career of geographer A.D. Sysoev merits inclusion in a discussion of scientists' subjectivities in the context of the transformation of the Southern Urals into the Soviet "nuclear shield" and in understanding the role of geography in the Soviet production of space during the foundational years of the Soviet Union's nuclear arsenal in the Southern Urals. Throughout the long and relentless course of Sysoev's prolific career he organized at least 34 scientific expeditions which played a key role in producing geographic and environmental knowledge of the Southern Urals, including thousands of water bodies and geologic features which had never before been measured, classified and rendered in scientific terms.[357] Significantly, in relation to the Soviet atomic project which transformed the Southern Urals into one of the most important regions for research and manufacturing for nuclear weaponry, Sysoev's groundbreaking contributions to regional geography of the Southern Urals served not only to guide later scientists' research efforts, but it also informed state planners.[358] Yet, apart from the sheer magnitude of data, maps, and geographical analyses he produced, from which later scientists, engineers, and planners benefitted, Sysoev's dedication to the unique landscapes, flora, and the myriad of hydrological features within Chelyabinsk oblast also reflected his devotion and reverence for such natural spaces. Over half a century's worth of experience in forestry served as his base from which he campaigned for the protection of regional forests and natural resources, including the city forests of Chelyabinsk city, to which it owes its beautiful, expansive parks and green downtown boulevards, allowing residents a literal

[357] S.G. Zakharov et al., *Problemy geografii Urala i sopredel'nykh territorii : III Vserossiiskaia nauchno-prakticheskaia konferentsiia s mezhdunarodnym uchastiem*, (Cheliabinsk: "Krai Ra", 2017).
[358] Ibid.

"breather" from otherwise oppressive air pollution.[359] In this way, a geographer producing knowledge of the living spaces of the Southern Urals, making them legible to state power and to the scientific method - as well as to his students and the public - also aimed to convey these landscapes' intrinsic worth and the need to protect them, both for their own sake, and the sake of society.

The long span of Sysoev's career illuminates his achievements as a geographer and, in present-day terms, an environmentalist, who came to fully know the Southern Urals region in not only textual but also tactile terms. In turn, he sought to freely share this knowledge, along with his devotion to these landscapes, through numerous field expeditions and his evident enthusiasm for sharing his own knowledge and experience with students of all ages and without regard for social background.[360] Such openness and disregard for the boundaries of class, ego, or professional hierarchies stand in contrast to the highly policed social hierarchies of scientific institutions ensconced in the military-industrial sites and (in)secure zones of the Southern Urals. In this way, locating Sysoev's subjectivity as a preeminent expert and key knowledge producer of space in such a sensitive region of the Soviet state becomes a complex task that resists simplistic reduction. This complexity reflects the unstable path which Sysoev, as well as his peers, needed to perpetually negotiate in the effort to continue their pursuit of knowledge without provoking the scrutiny and persecution of the Soviet security apparatus.

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[359] A. D. Sysoev, *Cheliabinskii Bor*, (Cheliabinsk: Iuzhno-Uralskoe knizhnoe izdatel'stvo, 1968).

[360] Zakharov et al., *Problemy geografii Urala*.

In word and deed, the socialist revolution and its Marxist principles figured centrally in Sysoev's life, from his participation in mass strikes as a youth in 1912 which led to his exile to a hard labor camp, to his service during the Civil War as well as the Great Patriotic War, his unpretentious rapports with both peers and students, and his attention to Marxist principles in Sysoev's numerous writings.[361] For example, anecdotes from his friends and acquaintances note that he was known for sharing his food rations with others during the war years, and once fell gravely ill as a result of giving his own coat to a youth who was poorly dressed for harsh winter weather.[362] While such self-sacrifice strays far beyond Marxist principles of equality, even in its most vulgar caricature, it reflects Sysoev's fidelity to the concept of camaraderie and his genuine willingness give himself wholly to the common good, without regard for ego or hierarchy.

In terms of his theoretical work in geography, one of his unpublished manuscripts, for example, includes an essay devoted to outlining the achievements of Soviet socialist physical and economic geography and developing his arguments for the global importance of Soviet socialist principles in geography. Significantly, one of the main points on which he based these arguments included stating that "Soviet geography, standing as sentinel of the world, dispelled foreign geographic theories which proposed laws on: 1) fertility rate changes, 2) overpopulation, 3) racial determinism in terms of

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[361] Ibid.

[362] Ibid.

human development, 4) environmental determinism."[363] Writing in 1955, Sysoev here draws attention to serious points of controversy in Western geographic thought, one which became a major source of criticism for implicitly excusing racist and imperialist agendas, and eventually giving rise to the field of critical geography. In addition, it is worth noting that during the early postwar years, many countries were, indeed, in the midst of struggles for independence against the hegemony of European colonial powers or in de facto colonial relationships with American companies.[364] From the vantage point of the twenty-first century, with the awareness of systemic inequality and injustice which did exist throughout the Soviet years, and of which the case of the Techa River Valley contamination serves as a prime example, it may be difficult to find sincerity in Sysoev's proclamation of Soviet geography as "sentinel of the world" against racism and inequality. Yet, from the vantage point of 1955, it is possible to understand the instrumental contributions of Soviet Marxist critiques of American and European imperialist and capitalist exploitation towards the social movements against the particular unjust world order that predominated at that point in the 20th century. In this way, one can interpret Sysoev portrayal of Soviet geography as "sentinel of the world" as a sincere assertion, rather than cynical lip service.

From a more personal perspective, Sysoev's own family background provides crucial insight into his affirmations of Soviet ideological virtues as he was born in 1890 in pre-Revolution Russia to such impoverished peasants that his mother saw no other

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[363] OGAChO, Fond R-456, opis' 1, delo 1, p. 25.

[364] John Newsinger, *The Blood Never Dried: A People's History of the British Empire*, (London: Bookmarks, 2006).

option but to allow another family to adopt him as a young child.[365] Having reached adulthood knowing first-hand the stark social and economic inequalities and violence of tsarist Russia Sysoev stood in a position which enabled him to deeply empathize with the humanitarian needs which Soviet Marxist ideology purported to address. Such experiences lend credibility to his words when he writes that the philosophy of Soviet geography concerns itself with the "transformation of nature by productive labor, the creation of a communist society."[366] This statement leaves little room to doubt that Sysoev's identity a scholar was fully invested in the Soviet project towards achieving equality and justice. However, in this particular passage, how he understands that a communist society is to be achieved is left more ambiguous. What role the "transformation of nature by productive labor" plays in this process is not explicitly defined. Yet in the same essay, Sysoev writes: "Through the years of Soviet rule, the relationship between humans and nature, has defined itself in the possibility of humans' influence upon nature, and in the same turn, the degree of nature's influence upon human society and its development."[367] This statement clarifies Sysoev's position as understanding humans and nature as parts of a single interactive process which plays an especially key role in Soviet society and its development towards "the creation of a communist society." Such concepts reflect fundamental principles of Marxism, but in relation to Sysoev's legacy in Chelyabinsk oblast and the environmental and public

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[365] Zakharov et al., *Problemy geografii Urala*.

[366] OGAChO, Fond R-456, opis' 1, delo 1, p. 22.

[367] Ibid.

health disasters which were unfolding during his most productive years, some questions remain about how to reconcile these statements with the history of the atomic project and radioactive contamination in the Southern Urals.

Did Sysoev at some point become aware of the highly secretive military operation at PO Mayak's facility and its impact upon the Techa River Valley and its communities? If so, how did he reconcile the knowledge of this activity with his faith in the Soviet path towards a communist society and his dedicated efforts to protect the unique landscapes and natural resources of the Southern Urals?

Given Sysoev's high-ranking status as a geographer and his highly productive career in researching, mapping, and rendering knowable countless natural features and spaces across Chelyabinsk oblast, it is difficult to imagine that throughout his numerous field research expeditions and mapping projects he would not have stumbled across the PO Mayak's secretive territory or encountered individuals associated with it or learned of it from one of his peers. As an example, in 1949, following a meteorite fall over territory that included both Kunashak and Kasli districts on June 11th of that year, Sysoev led an expedition to collect specimens of meteorite fragments which he later turned over to the Meteorite Commission of the Russian Academy of Sciences.[368] Being that both Kunashak and Kasli districts were among those included in the special security regime zone, Sysoev would have needed a special permit to lead this expedition. Such permits were only granted by the state security apparatus to high-ranking individuals with special

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[368] Zakharov et al., *Problemy geografii Urala*.

privileges.[369] Even so, the trust afforded to such individuals also came with the threat of severe punishment for betraying such trust.[370] Yet, given his own rural and impoverished origins, what may have been his reaction to the realization of the harmful risk posed by PO Mayak to the surrounding population? Without a record of any kind on which to base a reasoned hypothesis, one purely speculative possibility may be that Sysoev carefully weighed the option of blowing the whistle on PO Mayak careless poisoning of innocent civilians, which would lead to jeopardizing his life's work, or to simply work even harder to catalog and map all of the landscapes and features of the region and share them with as many students as possible, giving future generations the tools and information with which to carry on such work. It may be that of these two options, the latter appeared to be most likely to successfully bring about the greater good.

Fyodor Yakovlevich Kirin, Economic Geographer

The complexity of Sysoev's subjective position as a Soviet scientist and producer of spatial knowledge is thrown into sharper relief in comparison with one of his contemporary peers, Fyodor Yakovlevich Kirin, another preeminent and renowned geographer of the Southern Urals who also carried out much of his research during the same decades as the advancement of the Soviet nuclear arsenal at PO Mayak. Like Sysoev, Kirin led a prolific career in teaching geography and producing numerous groundbreaking works relating to theory as well as regional maps of Chelyabinsk

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[369] Novoselov and Tolstikov, *Taina "Sorokovki."*

[370] Ibid.; Kutepova and Tsepilova, "Closed city, open disaster."

oblast.[371] In particular, he specialized in economic geography, and is known for innovative approaches to methods and methodology in economic geography.[372] Additionally, Kirin shared Sysoev's enthusiastic embrace of Marxist-Leninist approaches to philosophy and theory in Soviet geography, including the concern for society's responsibility in safeguarding the environment from anthropogenic damage as well as other destructive factors. However, particular angles emphasized by Kirin in his work regarding Soviet geography illuminates a tendency which sets him apart from Sysoev's unwavering egalitarian principles. In particular, in terms of Russia's relationship to the rest of the republics of which the Union was composed, an entire essay included in a collection of manuscript drafts is devoted to making the case for the Russian Soviet Federative Socialist Republic (RSRSR) as being "first among equals."[373] While this equality among the sixteen republics is embraced as the "friendship of Soviet nations, establishing itself across almost four decades, following the harsh sacrifices of the Great Patriotic War, emerges as the driving force of our progressive development on the path towards communism," Kirin goes on to make clear that "the first place, according to its own greatness, economic significance, [and] historical role belongs to RSFSR…." The stark contradiction the two statements present to each other suggest a departure from scientific rationality that is difficult to reconcile with the high reputation Kirin's scholarly endeavors had earned him. Particularly in terms of the first statement's reference to the

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[371] "Kirin Fyodor Iakovlevich." Cheliabinskaia oblast', *Entsiklopedia Cheliabinskoi oblasti*. Date of publication not available, accessed 17 May, 2019, chel-portal.ru/enc/кирин-федор-яковлевич/.

[372] Ibid.

[373] OGAChO, Fond R-76, opis' 1, delo 1, p. 149.

Great Patriotic War, which the Soviet Union is likely to have lost without the vital resources and Red Army recruits from each of the sixteen Soviet republics, according to literature on the history of World War II,[374] Kirin's quick dismissal of such contributions in favor of Russia's "own greatness," amounts to an offense, all the more so in 1954, less than a decade after the war's end, at which time the entire Soviet population, throughout all its republics, had barely begun recovering from its profound war wounds.[375] In this way, Kirin's particular approach to framing matters of Soviet identity, ethnic identity, and even history itself reflects nationalistic, a Russo-centric, nationalistic bias which contradicts a fundamental Marxist-Leninist principle of class solidarity transcending national, ethnic, or racial identity.[376] As a result, such an approach lends itself to the Soviet state security apparatus prioritizing national defense at the expense of local marginalized communities, as in the case of PO Mayak in the Techa River Valley.

Producing knowledge of radiation safety

Historian of science Soraya de Chadarevian has argued for understanding the advancement of genetics research in the mid to late twentieth century by conceptualizing it in conjunction with geopolitical concerns and the acceleration of nuclear weapons technology in the postwar era.[377] The particular period of postwar scientific endeavors,

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[374] Amir Weiner, *Making Sense of War: The Second World War and the Fate of the Bolshevik Revolution*, (Princeton: Princeton University Press, 2012); Richard Overy, *Russia's War: A History of the Soviet War Effort, 1941-1945*, (New York: Penguin Books, 1998).

[375] Weiner, *Making Sense of War*.

[376] Tucker, *The Lenin Anthology*.

[377] Soraya de Chadarevian, "Mice and the Reactor: The Genetics Experiment in 1950s Britain," *Journal of the History of Biology*, 2006, 39: p. 707-735.

taking heightened momentum during the 1950s, represents an era of paradigm shifts in the geopolitics-science nexus. Concerns regarding security as well as intensified ideological rivalries drove large-scale research efforts and advancements in genetics not only in the Soviet Union and the United States, but also Great Britain. Significantly, the tragic and long-lasting consequences experienced by victims of the atomic and hydrogen bombs dropped on Hiroshima and Nagasaki in 1945, as well as high-profile accidents such as the October 10, 1957 Windscale fire and radioactive leak at a plutonium production facility in Cumbria, Great Britain—exposing workers to severely and often fatally high doses of radiation—spurred urgent questions to gain understanding of the particular danger radiation posed for biological organisms and how to most effectively keep such risks at bay.[378]

In the Soviet Union, the study of *radiatsionnaia gigiena*—literally, radiation hygiene, but more accurately translated as radiation safety—became a top priority for research in the early 1950s. Despite the sensitive and classified nature of much of the research on which radiation safety was based, particularly during the late 1940s, the field itself developed as a branch of public health and safety rather than as a matter of national security.[379] Research oriented towards radiation safety served to collect and analyze data regarding the effects of ionizing radiation on health and the environment with the

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[378] Ibid.; the Windscale fire and radioactive leak in Cumbria coincidentally occurred in the month following the Kyshtym explosion at PO Mayak.

[379] Laura Sembritzki, "Maiak 1957 and its Aftermath: Radiation Knowledge and Ignorance in the Soviet Union," *Jahrbücher für Geschichte Osteuropas*, 66, 2018(1), 45-64; Sonja D. Schmid, *Producing Power: The Pre-Chernobyl History of the Soviet Nuclear Industry*, (Cambridge, MA: The MIT Press, 2015).

overarching aim of developing safety measures to protect the labor force, particularly within nuclear industries, the general public, and the environment from the risk of harm associated with radioactive exposure.[380] Under the authority and policy direction of the Ministry of Health, the research institutes corresponding to the Academy of Sciences made significant contributions to building the knowledge base of radiation safety in the Soviet Union. For example, the Institute for Occupational Safety and Disease, played a key role in the establishing standard best practices and safety regulations for work activities that involved working in close proximity to radioactive substances.[381]

The Institute of Experimental Medicine (IEM) operated as a branch of the Academy of Medical Sciences (AMN) of the USSR which itself was subject to the authority of *Minzdrav*—the Ministry of Health. Records of the IEM, held at the Central State Archives of Scientific-Technical Documentation in St. Petersburg (TsGANTD-Spb) include transcripts of meetings, conference proceedings, as well as official correspondence which illustrate the emergence of radiation safety as a matter of urgency not only for medical practitioners and the Ministry of Health, but also as a state priority.[382] These documents, particularly those from 1953 to 1959, provide snapshots of researchers' work lives as they orbited around labs. In the following section, I will first draw from correspondence, transcripts of meetings, and outlines of annual research plans

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[380] Ibid.

[381] Laura Sembritzki, "Maiak 1957 and its Aftermath: Radiation Knowledge and Ignorance in the Soviet Union," *Jahrbücher für Geschichte Osteuropas*, 66, 2018(1), 45-64.

[382] Central State Archives of Scientific-Technical Documentation in St. Petersburg (TsGANTD SPb).

to follow their documentation of directions programmed by the Ministry of Health and the Council of Ministries for the IEM's research program as well as how IEM researchers, including newly minted cadres of graduates in emerging fields, executed the research goals with which they were tasked. In this way, these archival sources reflect the regular administrative as well as scientific aspects of the IEM's tasks in relation to its contribution to the emerging field of radiation safety. Second, apart from demonstrating many of the leading priorities guiding the research agenda of one of the key institutes charged with building the science of radiation safety in the Soviet Union during the 1950s, these archival materials allow glimpses into the seemingly endless slough of hindrances and stressors which hampered IEM researchers' progress. In this way, I will discuss the role of continuous lack of funding, resources, equipment, and adequately trained personnel in slowing the pace at which the IEM and AMN as a whole could contribute to the protection of the public from threats posed by radiation exposure.

Finally, I will focus the last part of this section on the laboratory animals that frequently appear throughout these texts. As IEM researchers relied primarily on non-human animals as experimental research subjects, these animals played decisive roles in shaping the course of research on a day-to-day basis. Laboratory animals both drove breakthroughs that advanced the science of radiation safety and were often blamed for disrupting the progress of work. While the question of ethical treatment lies outside the

scope of this dissertation, the fact of animal agency in this process of knowledge production warrants more than passing mention.[383]

Spetstematika at the Institute of Experimental Medicine

The term *spetstematika* was often employed to refer to the sensitive topics with which the IEM was charged with researching. *Spetstematika* translates literally to "special themes," but in practice it more accurately referred to research topics which often included those labelled as being of a classified nature, due to their close relationship with matters of national security, such as nuclear weapons production and other types of weaponry being developed during that period. Classified research topics included those relating to the diagnosis, treatment, and prevention of radiation illness syndrome as well as injuries and other manifestations of disease associated with exposure to ionizing radiation. By 1953, as nuclear technology had expanded in both military and civilian realms, such topics had climbed to the top of the AMN's research agenda. In the context of military and national security, the concern over radiation illness and the treatment of injuries stemmed from the threat of a nuclear attack from the United States striking both military personnel and civilian populations. Such apprehension is rendered vividly in a letter dated 14 October 1955, from the head of the Department of Medical Radiology in the Ministry of Health of the USSR, Evgenii Ivanovich Vorovyov, to Dmitriy Andreyevich Biryukov, Director of

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[383] For further scholarly treatments of animal agency in Russian and Soviet history see: Jane Costlow and Amy Nelson (Eds.), *Beyond the Human in Russian Culture and History*, (Pittsburgh: University of Pittsburgh Press, 2010) and Amy Nelson, "What the dogs did: animal agency in the Soviet manned space flight programme," *British Society for the History of Science (BSHS): Themes*, 2(2017): 79-99.

the IEM, listing a four-page list of recommendations to incorporate in the research plan for the coming 1956-1957 academic year. As Vorovyov wrote,

> The combined set of problems relating to injuries and illness associated with atomic weapons in our time takes on special, important significance. Primary attention in addressing this problem should be oriented towards scientific research and practice, taking into account its relevance to defense and its critical importance to life itself.[384]

The need to prepare to respond to potential injuries associated with nuclear explosions resulting specifically from potential enemy attacks is made explicit in many of the list's items which included recommending research projects aiming to develop prophylaxis and standard procedures specifically suited for treating "trauma to the face and jaw during an atomic attack" [385] along with the special circumstances and conditions that manifest with such injuries, and the development of "principles of first aid, triage, and evacuation during an atomic attack." [386] The unsettling and at times macabre reality of the nuclear threat evinced in the painfully thorough list conveys the Soviets' palpable fear of a possible repetition of the United States display of power over Japan only ten years earlier. As historian Michael Gordin notes, in the eyes of "many of these scientists, and for the soldiers and bureaucrats who worked with them, the budding cold war was a continuation of World War II (the Great Patriotic War, in Soviet parlance), and the American atomic

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[384] Letter from Evgenii Ivanovich Vorovyov to Dmitriy Andreyevich Biryukov, 14 October 1955. TsGANTD SPb, *Fond* R-182, *Opis'* 14, *Delo* 35, p. 5.

[385] Ibid. 5.

[386] Ibid. 7.

bombers who threatened the homeland were no different from Hitler's Wehrmacht." [387] Therefore, one could "imagine them seeing an image of the ravished postblockade Leningrad and projecting that to a nuclear-devastated Moscow." [388] At the same time, apart from aiming to meet the need to prepare for a possible nuclear attack, the Ministry of Health's recommendations for research regarding the evaluation, diagnosis, and treatment of radiation illness and injuries would also have borne relevance to potential accidents resulting from the Soviet state's own military activities such as atomic bomb tests which had begun in 1949.[389]

Apart from national security interests in nuclear technology, by 1955, the use of nuclear fission for energy production had begun to expand all across the Soviet Union, its accelerating growth proceeding in full momentum. Moreover, in medical practice and other public health realms such as food safety, the use of radioisotopes followed suit, as scientists strove to develop innovative solutions to the widespread public health challenges which still trammeled the Soviet Union's postwar recovery in 1955. Such efforts are exemplified in the Ministry of Health's Decree № 49s of 2 September 1958 which emphasized forging paths towards the expanding civilian uses of radioisotopes to serve the broader goals of advancing medicine, public health and safety, and energy production. For the Ministry of Health, the particular ambitions inspired by the potential

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[387] Michael Gordin, *Red Cloud at Dawn: Truman, Stalin, and the End of the Atomic Monopoly*, (Farrar, Strauss, and Giroux: New York, 2009), p. 143.

[388] Ibid.

[389] Ibid.

benefits of harnessing nuclear technology for advances in medicine are reflected in its order to the Presidium of the AMN as well as each of the Soviet republics' own ministries of health to bring to fruition scientific research projects pursuing the incorporation of radioisotopes and radiation in the following areas in 1959: "….biochemistry, physiology, pharmacology, microbiology, industrial toxicology, diagnostics and medical treatment of various illnesses, for cold sterilization of medication, serum, vaccines and antibiotics and biological synthesis of noted pharmaceutical drugs and compounds." [390]

Correspondingly, however, along with the expansion of nuclear technology throughout civilian industries, the incidence of workplace mishaps and injuries also multiplied, while the standards for responding to such events had not yet kept pace. In this way, these broader trends in the realm of the nuclear industry contributed to the heightened importance of research on radiation safety. This included the accelerating expansion of nuclear technology for civilian use, including energy production, as well as the use of radioisotopes in medical practice. Responding to the need to establish more robust institutional infrastructure to protect the public from the host of hazards being ushered into the wider population by increasingly ubiquitous radioisotopes, the Ministry of Health ordered, by Decree № 41 of 1 January 1958, the creation of *radiologicheskiye grupy*—in English, radiological groups.[391] Recently published research by historian

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[390] Decree of the Ministry of Health № 43s, 2 September 1958. TsGANTD SPb, *Fond* R-182, *Opis'* 14, *Inv*. 226, No. 38, p. 5.

[391] Laura Sembritzki, "Maiak 1957 and its Aftermath: Radiation Knowledge and Ignorance in the Soviet Union", *Jahrbücher für Geschichte Osteuropas*, 66, 2018/1, 45-64, p. 50.

Laura Sembritzki, whose meticulous sleuthing through scores of archival materials, much of which had not been utilized previously, has provided illuminating portraits of the legal contexts and bureaucratic honeycomb comprising the institutions charged with protecting the public from rogue radiation.[392] As she notes, radiological groups, serving under the authority of the Ministry of Health, were incorporated into the system of *sanitarno-epidemiologicheskie stantsii*, or sanitary epidemiological stations (SES), which already existed as part of the Ministry of Health's public health monitoring network throughout the Soviet Union.[393] In this capacity, radiological groups were responsible for the "preventive oversight of all industries, laboratories, and research institutions that applied radioactive materials or sources of ionizing radiation" from the standpoint of protecting public health and safety. [394]

In the context of treating radiation illness and injuries associated with radiation exposure, the IEM's research program during this time typically included investigative and experimental projects focusing on developing means of evaluating, diagnosing, and treating the impacts of ionizing radiation on animal organisms' immune system, infectious diseases, neurology, blood and vascular system, digestive system, as well as trauma such as wounds and burns. For example, at a meeting on 8 February 1954, senior researcher V. B. Isachenko presented preliminary results on experimental research using

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[392] Ibid.

[393] Ibid.

[394] Ibid. 50.

a radiation illness treatment referred to as *Preparat 88*.[395] Isachenko's results showed that *Preparat 88* decreased the mortality of mice with radiation illness from 100% to 45%.[396] Responding to a question about the potential to administer *Preparat № 88* to people with radiation illness, Isachenko responded, "*Preparat 88* works as a hypotension agent, and its use as treatment for humans is allowed, however for radiation illness it should be administered in large doses. The treatment is permitted to be administered to people, but it is not used for radiation illness there." [397] The transcript of the meeting does not provide any context to help identify the location to which "there" refers. However, at the meeting's conclusion, Isachenko's presentation and the positive response it received at the meeting resulted in adding to the list of action items an order for the Department of Pharmacology at the IEM to pursue the question about gaining permission to use *Preparat 88* for the treatment of radiation illness in humans.[398]

In addition to concerns regarding radiation illness and injuries, the IEM's research agendas during this postwar period overlapped with health risks emerging in conjunction with the development of a diverse repertoire of sophisticated chemical and biological weaponry not directly related to nuclear arsenals, as well as industrial and agricultural applications for such developments in chemical manufacturing. Research project plans

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[395] Transcript of meeting to review research progress at IEM. Senior researcher V. B. Isachenko to Professor N. P. Pobedinskiy. TsGANTD SPb, *Fond* R-182, *Opis'* 14, *Inv*. 192, No. 29, pp. 1-2. The term *preparat* can be roughly translated as "treatment", "formula," or "pharmaceutical drug."

[396] Ibid.

[397] Ibid.

[398] Ibid. 4.

from 1959 demonstrate focused attention on the development of antidotes for toxic exposures to organophosphorus compounds, which are used as insecticides as well as nerve agents, and pose lethally toxic threats to humans. The somewhat cryptic category label created for this particular topic, *Problema № 40a*, conveys the critical importance of the laboratory research it encompassed as an issue of both military and civilian concern. An official letter dated 24 September 1959, from the director of the Institute of Toxicology, Sergey Nikolaevich Golikov, to the director of the IEM, D. A. Biryukov, lists recommendations for research projects to incorporate into the plan for the following year, all of which center on "*Problema № 40a*, 'Toxicology and Anti-Chemical Protection.'"[399] These recommendations include investigating the pathogenesis of conditions caused by "chemical agents of mass destruction upon humans" along with developing standard clinical procedures to treat such conditions, the "mechanism of detoxification from organophosphorus compound poisoning in organisms," establishing "permissible concentrations of gaseous organophosphorus compounds," and streamlining methods of "removing mustard gas and organophosphorus compounds from food products." [400] Golikov's additional comments regarding these recommendations provide further insight into the significance *Problema 40a* carried not only in terms of strictly military concerns but also in broader, quotidian arenas of civilian life as well:

> Considering the wide use of organophosphorus agents in industry, agriculture, and medicine,… there arises the need to study not only extreme degrees of toxicity,

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[399] Letter from S. N. Golikov to D. A. Biryukov, 24 September 1959. TsGANTD SPb, *f.* R-182, *Opis'* 14, *d.* 49, p. 1.

[400] Ibid. 2-16.

> but also slight levels of toxicity. Research would preferably be carried out using a variety of animal species, as well as to define the earliest indicators of toxicity with which to establish the detection of biological indicators for weak levels of poisoning. Laboratory experiments need to correspond to clinical data, obtained from cases of patients treated for toxicity from organophosphorus insecticides, and with safety data, relating to work conditions…[401]

Golikov here draws attention to the extent to which such toxic substances as organophosphorus compounds were pervading mundane, civilian activities and places, and his mention of past cases of patients treated in clinical settings for toxic exposure to these substances demonstrates that, as in the case of radiation exposure, unintended mishaps were already occurring while the expertise needed to properly respond and prevent such occurrences had not yet caught up.

In the context of the military's direct interest in the IEM's research on toxicology of new chemical and biological agents, the IEM duly sent periodic reviews written by its established scientists to the S. M. Kirov Military-Medical Academy regarding current dissertation research produced by the IEM's doctoral students. In 1959, several such reviews were written regarding research centered on developing antidotes and other treatments specifically for the purpose of counteracting toxic exposure to organophosphorus substances. One particularly favorably reviewed dissertation investigating comparative pharmacological and therapeutic characteristics of tropine compounds introduced the topic as a timely and important contribution to the search for substances capable of more precisely controlled effects, such as antidotes for

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[401] Ibid. 3.

organophosphorus substances, a problem pursued by "many pharmacological and toxicological laboratories throughout the country and abroad" at that time.[402] This dissertation, titled *Comparative Pharmacological and Pharmacotherapeutic Characterics of Selected Tropine Compounds*, by V. G. Ovakimov, included in the discussion of applicability of the research findings to the development of effective antidotes for toxicity from nerve gas such as sarin and soman.[403] Another dissertation review sent to the S. M. Kirov Military-Medical Academy from 1959, titled *Development of Antidotes for toxic organophosphate substances for simplified human application*, by N. V. Savateev, underscores the significance of the work for ensuring the safety of the antidote substances studied, by noting that the work was first tested on animals and then upon human volunteers, including the dissertation author himself, and finally on soldiers undergoing combat training.[404]

The sensitive nature of the research projects undertaken at the IEM may explain the ongoing existence of restrictions placed on certain topics, not only those relating to radiation illness, but also many other topics that were emerging on the horizon of mid-century military technologies, such as chemical and biological warfare. The concern for restricting the flow of information related possibly not only to precautions taken regarding national security and restricting defense-related information from espionage, but also to the fact of the sensitivity of such information and its potential for widespread

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[402] Official correspondence from D. A. Egorov, head of First Dept. of the IEM to Colonel Danilov of the S. M. Kirov Military-Medical Academy. TsGANTD SPb, *Fond* R-182, *Opis'* 14, *Delo* 43, p. 2.

[403] Ibid. 6.

[404] Ibid. 17.

harm if accessible to both foreign and domestic parties with ill intentions. Accordingly, the administrators of the IEM followed directives to restrict certain matters by categorizing them as *spetstematika*, some of which carried the label *sekretno*, meaning "classified," or using cryptic titles to categorize certain themes. Research topics relating to radiation illness and injuries, for instance, were often referred to as *Problema № 19* throughout official correspondence, research project plans and summaries, and transcripts of meetings. The institutionalization of secrecy intensified at the IEM in 1953, as a meeting of leading researchers and administrators on 4 September of that year convened to announce decisions they had reached regarding the sensitivity of IEM research projects they had reviewed in the context of state secrecy. The review led to ordering the retroactive designation of numerous research projects that had already been conducted in 1951, 1952, and in the preceding months of 1953 as "classified" material. While the projects' publications and data were in effect not actually classified as they had already become accessible, applying "classified" label served the purpose of guiding the process of determining whether or not future projects should be considered restricted from open access due to their overlap with matters of state secrecy. In particular, research projects focused on diagnoses and treatments of malignant growths as well as "the study of the impacts of radiation upon organisms" were to be considered restricted and would bear the *sekretno* label. The decision announced at this meeting in 1953 suggests that the issue of radiation illness itself should be considered the determining factor in designating a given project as "classified." Indeed, official correspondence from the Vice President of the AMN at that time, F. G. Krotkov, to the IEM director, D. A. Biryukov, outlining the research projects for the IEM to take on for the second half of 1954 further confirm this,

while illuminating nuances regarding the specific research topics that set apart classified from unclassified material.[405] While Krotkov labelled as "unclassified" two planned research projects regarding the damaging influence of radiation upon the circulatory and respiratory systems and experimental lesions, a research project described as focusing on prophylactic treatment of radiation illness was labelled as "classified." [406] In any case, the letter conveys as sense of urgency and appreciation for the crucially importance of the topic of radiation illness, as Krotkov urges Biryukov to "take all measures within your authority to ensure the timely completion of the attached plan," given the "special importance and timeliness of radiation illness." [407]

It also is worth considering other concerns beyond the question of national security which could account for the attention to restricting certain types of research matters. One such concern relates to the issue of intellectual property claims. This concern is alluded to during a presentation of ongoing research projects at the IEM in 1959. Specifically, the presentation by researcher Vera Ivanovna Ilienko of the Department of Virology, regarding research focused on improving methods of diagnosing and identifying pathogens causing viral infections affecting the nervous system, with particular attention to tick-borne encephalitis, concludes with an exchange with IEM director and chair of the meeting, D. A. Biryukov, and head of Microbiology, Professor

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[405] Letter from F. G. Krotkov, Vice President of the AMN to D. A. Biryukov, Director of the IEM, 29 April 1954. TsGANTD SPb, *Fond* R-182, *Opis'* 14, *Delo* 28, p. 1.

[406] Ibid. 1-3.

[407] Ibid. 1.

V. I. Ioffe regarding the question of whether or not it should be considered a "closed" topic:

> Ilienko: In this part of the research, which is completed, there is no classified information, and it does not need to be closed. At this time there is a lot of research being carried out on tissue cultures.
>
> Chair [Biryukov]: Why do you think that this does not need to be a closed topic?
>
> Ilienko: This topic has been carried out widely—among us and abroad. Abroad there have not been any publications on dosages, but logically there must be about ten thousand working on this. I already reported on our results in *Mikrobiologicheskoe Obshchestvo* [journal] (though it's true that I did not discuss quantities), and I posed the issue in a somewhat different way. Ten thousand—this is naturally in the pursuit of improving methods, and everyone is striving for this same goal, so there is nothing to restrict here.
>
> Prof. Ioffe: I am not familiar with the literature on this issue—are there in the literature any comparable data regarding the use of suspended cells from chickens' embryonic fluid? Are there quantitative data regarding discrepancies or not? If in open literature you did not find this, then for now I would keep this material closed. I agree that other researchers might arrive at this data on their own, and I am not even sure that it hasn't already been done. Maybe someone else already achieved this—not among us, but abroad—but we don't know that.
>
> This research is interesting, and if restricting access to it does not delay your work, I would consider it restricted.
>
> Ilienko: People want to get diagnostic data sooner, they come to us from the periphery, they consult with us regarding our methods. Our methodology already became the property of many, and it's already out there.
>
> Chair [Biryukov]: We need to consult with higher authorities somehow regarding this question. I will, for now, insist on staying quiet about it.[408]

The exchange hints at a variety of concerns that typically continue to influence researchers to this day regarding intellectual property claims and the need to keep in-

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[408] Dialogue involving V. I. Il'enko, D. A. Biryukov, and V. I. Ioffe. Transcript of IEM meeting, 9 January 1959. CGANTD SPb, *Fond* R-182, *Opis'* 14, *Delo* 44, p. 13-17.

progress research protected until it is published or ready to be published. As Professor Ioffe's comment suggests, his main concern appears to stem from possible risks in terms of the project's vulnerability to criticism on the one hand, as well as plagiarism on the other hand, due to its methodological originality and divergence from what is established in existing literature, at least that which has been published "among us," within the Soviet Union. However, Ilienko's insistence on the de facto open accessibility of the topic, particularly in terms of the sheer multitudes whom she assumes are already applying similar or even identical methods in the use of tissue cultures for research aimed at improving and speeding up the diagnosis of viral diseases such as tick-borne encephalitis, suggests that she did not perceive any benefit to the project or even to the broader field by imposing any restrictions on its accessibility. To the contrary, by suggesting that the dissemination of information such as "diagnostic data" was excessively slow and so burdened by restrictions that many other researchers—perhaps even "ten thousand"—were already applying such methods and laying claim to findings obtained using them, Ilienko hints at a sense of frustration with unnecessary impediments placed in the path of advancing science and the crucial need to circulate innovative breakthroughs.

Additionally, by pointing out that so pressing was the need for such data, even outside the elite urban hubs of scientific research, that she and her team were being approached "from the periphery," perhaps by researchers or even medical practitioners working in areas throughout the country, beyond Moscow and Leningrad, overwhelmed by public health dilemmas caused by outbreaks of viral diseases, such as tick-borne encephalitis, that to impose restrictions would be counterproductive to the larger goal of serving the interests of public health. Ultimately, however, Biryukov invoked the need to

err on the side of silence and toe the line drawn by "higher authorities," thereby settling the matter.

Archival records of the IEM's official correspondence, meeting minutes and transcripts, and reports are peppered with laments, rebukes, along with other expressions of disappointment and even alarm regarding what was often described as slow progress or even the absence of any work being done at all to meet the tasks required of the institutes. For example, the transcript of a meeting of IEM researchers discussing progress of current work and the planned research program for the 1953-1954 term on 13 October 1953 IEM reveals frustration at the lack of enthusiasm among scientists for following through with radiation illness research which had been highlighted as an issue of top priority by the Ministry of Public Health. Among the concluding statements and warnings against further foot-dragging is the following comment by the head of radiology, Professor Pobedinsky:

> Topics of radiation illness are being developed by decree of the Council of Ministries; removing any topic requires special permission. The state provides plenty of resources and staff; we have to overcome this dismissive attitude toward this work. The research plan of the IEM carries over into 1954. Any expansion to the program will not go through, but omitting any part of the plan will also not be allowed." [409]

Pobedinsky's admonition allows a more close-up glimpse of the extent to which the grip of higher Soviet state authorities permeated the day-to-day business of producing research at the IEM, as he underscores the pressure from above—along with relatively

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[409] Statement by N. P. Pobedinskii, quoted from minutes of IEM meeting. TsGANTD SPb, *Fond* R-128, *Opis'* 14, *Delo* 25, p. 7.

generous funding—and the tight leash by which the Council of Ministries exercised control over research institutes. Therefore, the lackluster performance may have been the passive manifestation of resentment that such stifling micromanagement and intellectual rigidity likely stirred for both new and veteran researchers at the prestigious institute, regardless of how they might have perceived the urgency of radiation illness and their own critical role in developing protective measures and treatments against it.

Apart from the lack of flexibility and independence regarding the topics IEM researchers could choose to pursue, the practical challenges of taking on serious research questions regarding a relatively new field which required highly specialized and often prohibitively expensive equipment that could not be easily repaired when inevitable breakdowns occurred also posed continuous hurdles for research endeavors. As Physiology Department researcher N. I. Arinchin, at the same closed meeting in 1953, concluded his research progress report regarding the impacts of ionizing radiation on blood cell production in dogs, he mused, "One must approach the question of radiation illness with complexity; this is why the work in this field is so difficult." [410] Perhaps not surprisingly, Arinchin's appreciation of the complex nature of radiation illness along with the need to approach it with caution in research earned him direct rebuke from Biryukov at a follow-up meeting four months later in February 1954. Following Arinchin's progress report regarding his research, and specifically in response to the reported delay in starting the experimental phase involving the application of radiation as a result of

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[410] Statement by N. I. Arinchin, quoted from minutes of IEM meeting, 13 October 1953. TsGANTD SPb, *Fond* R-182, *Opis'* 14, *Delo* 25, p. 6.

changes implemented in the methodological approach, Biryukov dismissed the significance of Arinchin's preoccupation with research methods while he drove home the exigency of "getting results" and "picking up the pace towards the study's special task: the impacts of radiation." [411]

Biryukov's inability to hide his exasperation with the pace of progress of radiation illness research at the IEM can at least in part be interpreted as a reflection of the intense pressure exerted from the institutions perched above him in the chain of command. In Decree № 90 of the Presidium of the AMN, the Academy presents its response to a report by the AMN's Vice President, F. G. Krotkov, which found that all twelve institutes within the Academy were failing to meet the research goals prescribed by the Ministry of Health regarding *Problema № 19*—radiation illness. The decree notes that the Presidium itself, along with each of the twelve institutes' directors, bore responsibility for this failure resulting from their "underestimation…of the important, state significance of *Problema № 19* and the complex problems it comprises."[412]

Significantly, the decree also demonstrates the Presidium's recognition of its own shortcomings in efficiently administering the necessary funds, resources, and recruitment of adequately trained personnel to enable each of the institutes to pursue their assigned research plans. In particular, as decree notes, as a result of the Presidium's poor

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[411] Statement by D. A. Biryukov, quoted from minutes of IEM meeting, 8 February 1954. TsGANTD SPb, *Fond* R-182, *Opis'* 14, *Delo* 29, p. 1.

[412] Presidium of the AMN Decree № 90, 5 May 1954. TsGANTD SPb, *Fond* R-182, *Opis'* 14, *Delo* 31, p. 1.

administration of resources, the institutes lacked the "proper facilities to be used for irradiation of experimental animals, specialized apparatuses, protective gear (lead), and fund allotment for the procurement of experimental animals."[413] The guiltiest culprit appeared to be the Academic Council formed especially to work on *Problema № 19*, by resolution of the Presidium of the AMN on 4 November 1953, as "it literally did not do any work (only one meeting was convened, chaired by the academic Anichkov." [414] Additionally, the IEM was highlighted as one of the four institutes, along with Virology, Pediatrics, and Pathophysiology & Experimental Therapy, which were proceeding in such a way that raised serious alarm at the AMN.[415]

Much is often made of the especially generous funding made available to elite research institutes, particularly those working on issues relevant to highly sensitive topics that bore close relevance to the state's national defense interests. In this decree, the Presidium pointed out that despite the disbursement of 1,840,000 rubles to fund the procurement of special equipment and recruitment of personnel, the research plan on *Problema № 19* still found itself in jeopardy. In this way, a disconnect emerges into view between the financial management of state resources and their intended implementation. Additionally, a handwritten note, apparently written by IEM director D. A. Biryukov, to whom this copy of the decree was addressed, circled a statement regarding the 12 newly recruited personnel that were to be funded by the IEM's share of the fund allotment.

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[413] Ibid. 2.

[414] Ibid. 2.

[415] Ibid.

Biryukov's note refuted that number: "We need to inform them that we don't have twelve [new personnel]."[416] In this way, it becomes more and more clear that the apparent wealth of these elite research institutes as indicated by documents did not always reflect reality, but more accurately reflect their vulnerability, being at the mercy of the incompetence of authorities to which they were subject.

The problem of chronic shortages and entirely unavailable specialized equipment necessary for any work entailing the use of ionizing radiation posed ongoing, material impediments to the IEM, particularly in terms of advancing at a pace that would have satisfied the watchful eye of state bureaucracy. In an early example from October 1953, Biryukov concluded his progress report on the multi-project research plan assigned to the IEM, by highlighting the practical obstacles posed for moving forward with the experimental tasks involving the application of ionizing radiation on non-human animals: "Due to the lack of specially-equipped rooms, equipment, and personnel, the Institute has so far not begun the second and third projects—those involving isotopes—in the research plan."[417] Underscoring the IEM's protracted struggles to obtain the necessary provisions to carry out their assigned research plan, Biryukov recounted his repeated requests to the department of radiology at the Ministry of Health, specifically for highly specialized devices used for the application of ionizing radiation upon laboratory animals serving as research subjects, and the specially trained staff needed to correctly operate such

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[416] Ibid. 2.

[417] Written correspondence from D. A. Biryukov to A. I. Nesterov, Academic-Secretary of the AMN, 8 October 1953. TsGANTD SPb, *Fond* R-182, *Opis'* 14, *Delo* 25, p. 7.

equipment and successfully carry out experimental tasks. Exemplifying the high cost of the technology necessary for the study of radiation illness, Biryukov budgetary list included requests for 4,000 rubles to purchase two dosimeters and 30,000 rubles for irradiating devices.[418] As the IEM's archival records from 1953-1959 demonstrate, such requests were continuously repeated and just as often went unanswered, creating a feedback loop where lack of necessary resources and staff resulted in failures to fulfill research plans on time, which would further invite close scrutiny and reluctant allotments of funds from the Ministry of Health.

In spite of the relative prestige and elite status of research institutes such as the IEM, and the high state significance of the *spetstematika* research with which they were tasked, the funds allotted did not ensure that they would have access to the newest technology. Therefore, while experiments involving the irradiation of laboratory animals formed a major component of the IEM research plans, in 1954 they had not received from the Ministry of Health the complete research funding they had requested, forcing the institute to accept from the Roentgenological Institute old x-ray devices which were deemed "quite suitable for radiating animals." [419] Apart from the scarcity of specialized equipment needed to conduct experiments involving the application of ionizing radiation, minutes of meetings at which researchers convened with the IEM director and senior

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[418] Ibid. 7. In terms of understanding what such amounts could mean to the average Soviet citizen in 1953, the average annual wage in the Soviet Union in 1950 was 7,668 rubles, while one estimate holds that by 1953, the annual wage had reached 8,100 rubles. Alec Nove, *An Economic History of the U.S.S.R.*, (New York: Penguin Books, 1984), 312-313.

[419] Statement by M. N. Pobedinskiy, quoted from minutes of meeting, 8 February 1954. TsGANTD SPb, *Fond* R-182, *Opis'* 14, *Delo* 29, p. 2.

scientists regularly tell of shortages of relatively inexpensive and commonplace laboratory tools such as pipettes as this was repeatedly cited as an additional setback slowing down progress in a given project.

As much of the literature regarding the history of nuclear technology in the Soviet Union points out, scientists and laboratory technicians were faced with such chronic shortages in both the bare essentials of safety gear such as rubber gloves and more sophisticated equipment such as dosimeters were experienced more often than not.[420] Yet, scarce funding counts as only one factor among others in creating safety hazards, as Sembritzki points out, such as the frequent violations of safety regulations, even among radiological group personnel, and the overall dysfunctional system of radiation safety monitoring and enforcement.[421] At the same time, despite the challenges faced, the growth and expansion of nuclear science at research institutes and academic institutions, created opportunities for deeper interdisciplinary cooperation and dialogue between otherwise compartmentalized fields. Taking note of this at a meeting convened by multiple institutes to discuss research progress on *Problema № 19*, the director of the Roentgenological Institute, M. N. Pobedinskiy, advocated for the beneficial potential of creating more interdisciplinary coordination among the institutes:

> The study of the impact of radiation upon living organisms is a topic many institutions are working on, but unfortunately, this work is still insufficiently coordinated. There is overlap—there are cases in which when we do not take advantage of our opportunities. For this reason we find it advisable to propose—

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[420] Novosel, Taina Sorokovka, Kuznetsov, Sembritzki, Brown, Josephson.

[421] Bauer, "Mutations in Soviet public health science"; Josephson, Red Atom.

> for the coordination of work by departmental branches of our science, to create commissions, which could chart the topics of the coming year, without any order or decree, but rather by agreement reached by each of the separate institutions.[422]

In this way, Pobedinskiy encouraged more unified and comprehensive research in the sense that by increasing communication between the individual research institutes, they could not only avoid duplicating tasks that did not need duplication, and at the same time, participate in complex, interdisciplinary research endeavors.

It is worth acknowledging the role of non-human animals in the course of scientific research carried out in pursuit of knowledge on radiation and the hazards and opportunities it offered in the nexus of national security-medicine-economic development. As has long been a common practice in scientific communities across the world, animals were used commonly for this research. Any projects involving humans are simply not available in unclassified material. In numerous cases, research projects stalled or had to be revised altogether as a result of problems arising from unexpected occurrences that rendered a particular group or species of animal unsuitable for a given experiment. Throughout the archives of the IEM, one can find the common complaint regarding the "poor quality" of mice and other animals causing delays throughout experimental phases of research. One project investigating the influence of fever on the excretion of radioisotopes had involved a method of testing and comparing outcomes of exposure to radioisotopes in rats with and without fever. However, the project stalled due to the technicians' inability to induce fever in any of the laboratory rats. The presenters

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[422] Statement by M. N. Pobedinskiy, quoted from minutes of meeting, 27 April 1954. TsGANTD SPb, *Fond* R-182, *Opis'* 14, *Delo* 30, p. 53.

noted that "there remains work to be carried out with rabbits, although this rather complicates the biochemical aspect."[423] To this, Professor Pobedinskiy responded, "Rabbits as experimental subjects for research with radioactive substances are ill-suited, as they are more susceptible to shock. It is more advisable to carry out this experiment on cats or dogs."[424]

[423] Statement by N. P. Veselkin and V. S. Ilyin, quoted from meeting minutes, 13 October 1953. TsGANTD SPb, *Fond* R-182, *Opis'* 14, *Delo* 25, p. 6.

[424] Ibid.

CHAPTER VI: THE GLOBAL COMMODIFICATION OF NUCLEAR WASTELAND IN THE POST-SOVIET ERA

Initial expansion to SNF reprocessing technology beginning in mid-1970s

Whether serving civilian or military purposes, the production of nuclear materials necessarily involves fuel assemblies of uranium and plutonium arranged in varying concentrations for the purpose of generating reactions that result in energy release.[425] This fuel assembly serves as the core of the nuclear fuel cycle, both for weapons production and nuclear energy reactors.[426] After a certain amount of time in energy production use, the materials used in fuel assemblies decrease in capacity to generate nuclear reactions, even while they are still significantly radioactive and require special management to ensure radiation safety.[427] At this point, these fuel assemblies contain what is termed spent nuclear fuel (SNF), which can be reprocessed into productive fuel again, as well as various kinds of radioactive wastes.[428] The concept of reprocessing SNF is often termed "closing the nuclear cycle" to emphasize the continuous reuse of materials and the reduction of waste.[429] The extent to which a given amount of fuel can be repeatedly reprocessed while minimizing loss or waste of materials depends on the

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[425] International Atomic Energy Agency (IAEA), *Radiation, people and the environment*, J. Ford (Ed.), (Vienna, Austria: IAEA, 2004).

[426] Ibid.

[427] Egorov et al., *The Radiation Legacy of the Soviet Nuclear Complex*.

[428] Ibid.

[429] Ibid.; B. F. Myasoedov et al., "Nuclear Fuel Cycle and Its Impact."

nuclear reactor type in which it is being reprocessed and the reactor's technological capacity and speed.[430]

Background of SNF reprocessing operations at PO Mayak

At PO Mayak, the reprocessing of SNF as part of the weapons production process had formed an integral component of the facility since its beginning, carried out by the radiochemical plant (RT-1) within the PO Mayak complex.[431] In the early 1970s, the Soviet Union began expanding its industrial operations in reprocessing SNF.[432] As Egorov et al. note, in 1971, PO Mayak began reprocessing SNF from other nuclear reactors throughout the Soviet Union as well as from nuclear-powered naval vessels.[433] The significance of PO Mayak's expansion into "closed nuclear fuel cycle" is that it enabled the facility opportunities to broaden its economic and industrial viability during the time when the Soviet Union had begun to seek a path towards nuclear disarmament.[434] One of two main reasons for this development included the broader effort to act in accordance with the goals of the Treaty on the Nonproliferation of Nuclear Weapons Treaty (NPT) signed in 1968 (UN Office for Disarmament

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[430] Ibid.

[431] Egorov et al., *The Radiation Legacy of the Soviet Nuclear Complex*.

[432] Donnay et al., "Russia and the territories of the Former Soviet Union."

[433] Egorov et al., *The Radiation Legacy of the Soviet Nuclear Complex*.

[434] Jon B. Wolfsthal, Cristina-Astrid Chuen, Emily E. Daughtry, *Nuclear Status Report: Nuclear Weapons, Fissile Material, and Export Controls in the Former Soviet Union*, (Washington, DC: Carnegie Endowment for International Peace, 2001). Internet Resource.

Affairs).[435] In particular, as concerns regarding the proliferation of nuclear weapons across the world loomed on the geopolitical stage, the Soviet Union's large fleet of nuclear-powered submarines stood as potential security risks given the ease with which the vessels' fuel assemblies could fall into the possession of unauthorized actors.[436] At the same time, by expanding its role into civilian realms of nuclear production, PO Mayak further established its economic and industrial viability in spite of the steady decrease in demand for weapons-grade plutonium.[437]

The second main reason for expanding SNF reprocessing operations lay in the need for securing adequate supplies of uranium at a time when existing global uranium ore reserves were unknown, in addition to uncertainty regarding the ability to access them.[438] Therefore, SNF reprocessing ensured a quantifiable supply of uranium to sustain and continue developing civilian nuclear energy production in the Soviet Union.[439]

Stockpiles of plutonium at PO Mayak for future use

The international call to scale down nuclear weapons production in accordance with the 1968 NPT along with the growing need to diversify the economic and industrial

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[435] "Treaty on the Non-Proliferation of Nuclear Weapons: Text of the Treaty." *Disarmament Treaties Database*, United Nations Office for Disarmament Affairs (UNODA), [date of webpage publication not shown], disarmament.un.org/treaties/t/npt/text.

[436] Thomas Nilsen and Nils Bøhmer, *Sources to Radioactive Contamination in Murmansk and Arkhangel'sk Counties*, (Oslo: Bellona Foundation, 1994).

[437] Ibid.

[438] Egorov et al., *The Radiation Legacy of the Soviet Nuclear Complex*.

[439] Ibid.

relevance of nuclear production facilities in the Soviet Union gave rise not only to the expansion of SNF reprocessing, but also to the development of specialized storage facilities in which to dispose of what was considered "excess" quantities of weapons-grade Plutonium-239.[440] Excess quantities of plutonium became defined as such in accordance with the NPT.[441] The question of how to securely handle excess plutonium required an especially large-scale and complex response given that the Soviet Union was believed to hold the largest inventory of plutonium in the world.[442]

One of the directions PO Mayak pursued in responding to the need to safely handle plutonium that would not be used for weapons production was to simply stockpile it for future use.[443] This approach was based on the anticipation of future developments in nuclear technology that would enable weapons-grade plutonium to be blended with uranium to produce mixed oxide fuel (MOX).[444] Specifically, the development in nuclear technology anticipated by the Soviet ministry of atomic energy, Minatom, was the design and construction of fast-neutron reactors (FNR) which could use MOX fuel to generate nuclear energy.[445] In this way, such a lucrative, civilian

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[440] Wolfsthal et al., *Nuclear Status Report.*

[441] "Treaty on the Non-Proliferation of Nuclear Weapons," UNODA.

[442] Ibid.

[443] Ibid.

[444] Mironova et al., "The most contaminated place on Earth."

[445] Ibid.

purpose for weapons-grade plutonium rendered the possibility of producing MOX fuel as especially attractive incentive for stockpiling plutonium.[446]

While the stockpiling of plutonium as well as radioactive wastes is commonly practiced in the United States, Great Britain, France, China, India, Pakistan, and other countries possessing commercial nuclear reactors to produce energy, two aspects set Russia apart.[447] The first aspect is that PO Mayak, as at other plutonium production sites in Russia, the amount of plutonium is not only greater than anywhere else in the world, but the exact amount in its inventories has never been disclosed.[448] The second aspect is that given the track record of serious nuclear accidents in Russia, and especially at PO Mayak, the safety and security risks inherent in such large stockpiles of plutonium continue to raise concerns for local residents and the international community.[449]

PO Mayak as an international "recycling" plant of spent nuclear fuel

The economic aspect which rendered the reprocessing of SNF a critical area of economic growth for the Soviet nuclear industry during the 1970s became even more crucial for Russia during the economic crisis which unfolded nationwide in the wake of the dissolution of the Soviet Union.[450] In this way, while PO Mayak had become the

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[446] Egorov et al., *The Radiation Legacy of the Soviet Nuclear Complex*.

[447] Nilsen and Bøhmer, *Sources to Radioactive Contamination.*

[448] Ibid.; Wolfsthal et al., *Nuclear Status Report.*

[449] Mironova et al., "The most contaminated place on Earth"; Wolfsthal et al., *Nuclear Status Report.*

[450] Ibid.

final destination of SNF from nuclear reactors including naval vessel reactors throughout the Soviet Union as well as its satellite states before the dissolution in 1991, after the dissolution the incoming traffic of SNF and radioactive wastes from other countries such as Finland and Germany to be reprocessed at PO Mayak and sent back to the countries of origin provided a vital source of revenue.[451] Therefore, while the short-lived rise of Russia's environmental movement in the early 1990s led to legislation that prohibited the permanent storage of foreign SNF and radioactive waste on Russian territory, the political changes that accompanied Vladimir Putin's ascent to power in the late 1990s almost immediately reversed the progress in PO Mayak's transparency and accountability for which local environmental and social organizations had so diligently campaigned.[452] Arguing for the economic prioritization of the nuclear industry, Putin lifted the ban on permanent storage of foreign SNF and radioactive waste.[453] Indeed, as Natalia Mironova writes of her short-lived tenure as director of the environmental oversight commission in the city of Chelyabinsk, the reactionary old guard of former Communist Party members exploited the economic crisis and their enduring ties with Moscow to regain traction in local power structures in the Southern Urals and eventually undo much of the progress for which Mironova and many other activists had campaigned since the late 1980s.[454] Within these entrenched local power structures, PO

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[451] Nilsen and Bøhmer, *Sources to Radioactive Contamination.*

[452] Mironova et al., "The most contaminated place on Earth."

[453] Ibid.

[454] Ibid.

Mayak had held an especially privileged position, as a "state within a state," transcending governance and law since its creation in 1948.[455] As long as this exceptionally privileged state-within-a-state was left intact, along with the same key officials who maintained it, the transition from Soviet socialism to a market-driven society did not give way to meaningful democratic change in the Southern Urals.[456] In this way, PO Mayak assumed a lucrative position as a key player in the increasingly important global realms of SNF and radioactive waste handling and disposal, while public health and environmental concerns became relegated as secondary to the prioritized concern of economic development both locally and nationally.

PO Mayak's ascent in the years following the dissolution of the Soviet Union is significant for two reasons. First, it allowed PO Mayak to position itself as an indispensable actor in the ongoing geopolitical and diplomatic contexts of nuclear disarmament and non-proliferation. In terms of complying with the NPT, nuclear warheads and other military equipment is routed to PO Mayak's reprocessing facility where they are dismantled.[457] Relatedly, weapons-grade plutonium is removed and stored.[458] Additionally, PO Mayak is one of the primary destinations upon which the International Atomic Energy Agency (IAEA) focuses in order to verify Russian

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[455] Kutepova and Tsepilova, "Closed city, open disaster."

[456] Ibid.

[457] Egorov et al., *The Radiation Legacy of the Soviet Nuclear Complex*.

[458] Ibid.

compliance with the NPT.[459] Second, PO Mayak's ascent has defined the Southern Urals as a key hub in the traffic of radioactive materials from across the globe.[460] As citizens of countries with significant stores of SNF and radioactive waste express ever greater unease and opposition to the storage of such hazardous wastes in their communities, many of these countries, such as Germany, Belgium, Norway, Finland, Romania, and others have been willing to pay high costs to export these materials to Russia.[461] Given PO Mayak's highly skilled workforce, along with its existing infrastructure to handle a wide range of SNF and radioactive wastes, the Russian government and nuclear industry set their sights on exploiting what they viewed, and presently continue to view, as an especially competitive advantage in the global market for SNF reprocessing and nuclear waste disposal.[462]

Role of the United States in further expansion of PO Mayak SNF reprocessing facilities and activity

In the wake of the dissolution of the Soviet Union in December 1991, the so-called "new world order" famously heralded by President George H. W. Bush ushered in a period of closer, if cautious, collaboration between the nuclear-industrial establishments

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[459] Hans Blix, *Statement to the 41th Session of the General Conference of the IAEA, 29 September 1997*, (Vienna: International Atomic Energy Agency, 1997).

[460] Nilsen and Bøhmer, *Sources to Radioactive Contamination,* Egorov et al., *The Radiation Legacy of the Soviet Nuclear Complex*, Paula Garb, "Complex problems and no clear solutions: radiation victimization in Russia," in *Life and Death Matters: Human Rights, Environment, and Social Justice, 2nd edition*, Barbara Rose Johnston (Ed.), (Walnut Creek, CA: Left Coast Press, Inc., 2011).

[461] Ibid.

[462] Ibid.; Egorov et al., *The Radiation Legacy of the Soviet Nuclear Complex*; N. E. Bixler et al., *Review of spent fuel reprocessing and associated accident phenomena*, (Washington, DC: Office of Nuclear Regulatory Research, U.S. Nuclear Regulatory Commission, 2017).

of the United States and the Russian Federation. The United States' official position regarding the nature of diplomatic relations between the two countries following the dissolution provided three main reasons for pursuing close collaborative relations between the American and Russian nuclear-industrial establishments, as headed by their respective federal agencies - Department of Energy (DOE) in the U.S. and Ministry of Atomic Energy (Minatom) in Russia. The first main reason arose in relation to the existing Cooperative Threat Reduction (CRT) program, also known as the Nunn-Lugar Program, which was created for the purpose of neutralizing the Soviet Union's arsenal of not only nuclear, but all weapons and infrastructure with the potential of mass destruction. In a broader sense, this program supported the principle of non-proliferation which had become a fundamental tenet of global security and diplomatic policy.[463] The second main reason the DOE pursued close partnerships with Minatom after 1991 centers on the growing concern regarding the security of weapons-grade materials and technology, specifically in terms of their accessibility to unauthorized users who may potentially deploy such materials for the purpose of executing terrorist plots. Third, in the wake of the Chernobyl nuclear accident in 1986, along with the world's broadening awareness of the long history of radioactive contamination events having taken place in the Soviet Union, the concern for health and environmental

[463] "Treaty on the Non-Proliferation of Nuclear Weapons," UNODA.

safety, not only in the former Soviet Union, but across the globe, necessarily took on an urgent register.[464]

In addition to the official objectives for which the United States pursued an apparently more amicable and closer collaborative relationship with Russia's nuclear-industrial establishment, this new atmosphere of warmer collaborative relations along with Russia's weakened leverage and negotiating power in the midst of its growing economic crisis presented especially lucrative opportunities for private American entrepreneurs and corporations.[465] This resulted from numerous contracts made available to private bidders by the DOE as well as Department of Defense (DOD) as part of a range of construction projects and training programs negotiated between the two countries in order to help Russia safely dispose of or more effectively secure its inventory of nuclear weapons-grade material and to provide necessary upgrades to radiation safety infrastructure as well as training for the workforce at nuclear energy plants as well as specialized hubs of nuclear production facilities such as PO Mayak. Among the corporations whose bids won contracts to upgrade reprocessing and storage facilities at PO Mayak as well as construct new facilities, Bechtel Corporation stands out as one with a leading role. As archived records from correspondence between Nuclear Regulatory Commission (DOE) and demonstrate, Bechtel was awarded a contract to upgrade and expand PO Mayak's main reprocessing facility in 1993. However, Bechtel's record of engineering and construction projects, including cleanup

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[464] Whiteley, "The compelling realities at Mayak."

[465] Thomas Nilsen, Igor Kudrik, and Alexandr Niktin, *The Russian Northern Fleet: Sources of Radioactive Contamination, Bellona Report Vol. 2*, (Oslo, Norway: The Bellona Foundation, 1996).

and upgrades at Washington's Hanford shows indications of failing to meet established safety standards which raises questions about the quality of Bechtel's projects at a site where the stakes for health and environmental safety are particularly high.[466]

Apart from the rise of ethical questions regarding the equity of collaborative relationships between the United States and Russia in the midst of private enterprises' potential exploitation of Russia's massive health, environmental, and economic crises for profit, Russian officials raised their own concerns about the equity of the partnerships being formed between the two nations. A collection of correspondence held in NRC Commissioner De Planque's archived records includes mentions of NRC and DOE officials' reflections and considerations regarding their Russian partners' questions and concerns regarding intellectual rights over the data they possess relating to the medical histories of radiation exposure victims as well as ecological research carried out in contaminated areas. Furthermore, in more recent history, Russian nuclear industry officials have made reference to the disappointment of what they perceive as broken promises for financial assistance from the United States over the past few decades regarding technological development of radioactive waste disposal and SNF reprocessing construction on Russian territory and on Russian terms. For example, in October 2016, the Deputy Foreign Minister Sergey Ryabkov announced technological

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[466] "Department of Energy Cites Bechtel National Inc. for Worker Safety and Health Program Violations," *Department of Energy*. U.S. DOE. April 25, 2018. www.energy.gov/articles/department-energy-cites-bechtel-national-inc-bni-worker-safety-and-health-program; Sally Denton, *The Profiteers: Bechtel and the Men Who Built the World*, (New York: Simon & Schuster, 2016).

advancements in Russia that have now enabled a new method of plutonium disposal.[467] This new method, as described by Ryabkov, involves incineration within a nuclear reactor, not only represents a departure from the method commonly used in American facilities, but also is reported to be pose less ecological threat while costing less money.[468] A key point in Ryabkov's announcement made note of the departure from a partnership agreement with the United States, partly due to what Russia perceived as the United States' failure to fulfill their end of the partnership agreement in assisting Russia with the disposal of excess weapons-grade plutonium.[469] As Ryabkov pointed out: "...the experience of implementing this agreement has showed that the Americans from the very beginning didn't behave like partners as regards their promises to give us financial assistance. It was clear by the mid-2000s that there would be no real support in this sphere."[470]

These examples of the role of the United States in establishing agreements and collaborating with Russia to secure and upgrade its nuclear facilities and ensure compliance with the principles of nuclear non-proliferation demonstrate that United States has played, and continues to play a key role in the outcome of developments of Russia's nuclear-industrial developments, at times in ways that differ from the original

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[467] "Top diplomat reveals advantages of Russia's plutonium disposal method." TASS Russian News Agency. 19 October 2016.

[468] Ibid.

[469] Ibid.

[470] Ibid.

intent of U. S. involvement, as the cases of Bechtel and the faltering partnership cited by Russia's Deputy Foreign Minister Sergey Ryabkov.

NASA contract to purchase plutonium from PO Mayak in early 1990s

In a special agreement not related to partnership agreements on radioactive waste disposal or SNF reprocessing facilities, the National Aeronautics and Space Administration (NASA) of the U.S. and PO Mayak negotiated terms by which NASA would purchase non-weapons-grade Plutonium -238 for use in specialized battery packs designed to power spacecraft intended for long exploratory cosmic journeys which could potentially last a few decades without having the opportunity to refuel or recharge. The archives of the organization Greenpeace include documents announcing this agreement as well as the concerns of environmental advocates about the ethical and environmental implications of a U.S. government agency entering into a purchasing agreement with PO Mayak without establishing more stringent requirements to protect local landscapes and communities from potential impacts of perpetuating plutonium production.

One of the goals of Greenpeace activists at that point in 1992 was to petition and pressure NASA to use the potential deal with PO Mayak as leverage with which to require more concrete progress in improving local environmental conditions and funding greater support for local communities, especially those most seriously impacted by the health hazards and economic losses resulting from decades of radioactive contamination. However, the deal proceeded as planned and continued until 2009 when Russia announced it would not continue selling plutonium to NASA for the foreseeable

future. Not long following this announcement, engineers in the United States announced the automation of plutonium production which will ensure a stable supply of Pu-238 for NASA.

Relationship between civil society and PO Mayak in the face of new risks in radioactive contamination

In spite of the economic crisis following the dissolution of the Soviet Union, the period following 1991 ushered in the unprecedented growth of civil society groups vocalizing their concerns as citizens and demanding responsive action by government bodies.[471] In particular, the immediate aftermath of the dissolution of the Soviet Union and the tumultuous period that followed it gave rise to increasing environmental concerns vocalized by such civil society groups.[472] In some ways, the years of *perestroika* in the late 1980s, marked by the 1986 Chernobyl nuclear accident necessarily shaped the character of post-Soviet civil society.[473] In continuation of the call for democracy and greater accountability to the citizenry, Boris Yeltsin vocalized agreement with social-environmental activists in the Techa River Valley who called for the recognition of their rights as victims of radiation exposure as well as the right to receive government compensation.[474]

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[471] Mironova et al., "The most contaminated place on Earth."

[472] Ibid.; Laura A. Henry, *Red to Green: Environmental Activism in Post-Soviet Russia*, (Ithaca: Cornell University Press, 2010); Edelstein et al., *Cultures of Contamination*.

[473] Henry, *Red to Green*.

[474] Mironova et al., "The most contaminated place on Earth."

Discursive production of "radiophobia" as a disinformation tool

As *perestroika* dovetailed with the massive outrage throughout the Soviet Union and the public's demands for transparency following the tragedy of Chernobyl in 1986, many citizens in the Southern Urals began to learn of the real reasons behind forced relocations they had been subjected to, mysterious illnesses that had afflicted neighbors, co-workers, and family members. After decades of enduring radioactive contamination completely unaware of it, many of these citizens turned the outrage and grief over the years of pain and loss caused by PO Mayak's practices into organized opposition against PO Mayak and civic engagement in their communities.[475] Such community organizing and civic engagement resulted in tangible progress exemplified by the declassification of years of records relating to PO Mayak's policies and practices, as well as federal legislation such as the prohibition of permanent storage of foreign SNF and radioactive waste on Russian territory.[476]

However, Russia's nuclear industry, along with conservative and reactionary politicians began to construct a public relations narrative which increasingly, during the late 1990s, involved elaborate smear campaigns against progressive politicians who raised concerns about health and ecological impacts of nuclear production as well as social and environmental activists.[477] In the Southern Urals region specifically, PO Mayak officials with access to local mass media ran propaganda campaigns aimed at

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[475] Edelstein et al., *Cultures of Contamination*.

[476] Mironova et al., "The most contaminated place on Earth"; Kutepova and Tsepilova, "Closed city, open disaster."

[477] Ibid.; Whiteley, "The compelling realities at Mayak"; Brown, *Plutopia*.

discrediting the organizations and individuals who were leading the calls for transparency and accountability regarding the history of radioactive contamination to which local communities were subjected by PO Mayak.[478] Such campaigns not only sought to discredit social and environmental activists by accusing them of being funded by foreign groups seeking to undermine Russia's economic interests, but they also deployed the term, "radiophobia" as a cognitive flaw among poorly educated and misinformed individuals whose concerns regarding radiation exposure and contamination are rooted not in reality but in ignorance regarding the nuclear science.[479] As medical anthropologist Magdalena Stawkowski writes on the construction of radiophobia across a variety of radiated landscapes, particularly in the former Soviet Union, it is used in all of these settings as a tool with which to minimize and even mythologize "decades of violent histories and toxic legacies."[480] In this way, such public relations campaigns, powered by funding from both the Russian state and Minatom (the Ministry of Atomic Energy in Russia) effectively decreased public support for the local environmental oversight commission, Movement for Nuclear Safety, and eroded individuals' trust in their own abilities to distinguish hazard from safety.[481]

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[478] Kutepova and Tsepilova, "Closed city, open disaster."

[479] Ibid.

[480] Magdalena E. Stawkowski, "Radiophobia had to be reinvented," *Culture, Theory, and Critique*, 2017, 58(4), p. 359.

[481] Mironova et al., "The most contaminated place on Earth"; Grunberg, *Chelyabinsk*.

Whistleblowers and activists portrayed as threats to national security

In addition to becoming victims of smear campaigns, social and environmental activists in the Southern Urals as well as Russia, have been portrayed not only by the nuclear industry but the Russian state as threats to Russia's national security. Among the most well-known of these cases involves a former Russian Navy officer, Andrei Nikitin, who became a vocal environmental activist with the organization, Bellona Foundation, calling for attention to the severe risks of radioactive contamination posed by the large number of idle nuclear-powered submarines in the Russian North. Nikitin was arrested on charges of treason and espionage, and he endured four years of wrongful imprisonment until he finally won his case for acquittal of these charges.[482] In other cases, such as that of Thomas Nilsen, a journalist who has spent many years investigating sources of radioactive contamination impacting the Arctic region, Russian nuclear industry officials with international clout acted to persuade Nilsen's employer, *The Barents Observer*, to temporarily dismiss him for what had been described as defamation of Russia's nuclear industry.[483]

Within the past few years, among the most severe examples of the threat faced by whistleblowers and activists is reflected in the experiences of the sociologist, lawyer, and activist, Nadezhda Kutepova, who was born and raised in the restricted city of Ozyorsk, formerly Chelyabinsk-40. As a lawyer and activist, she devoted years towards helping victims of radiation exposure bring forth their legal claims for

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[482] Nilsen et al., *The Russian Northern Fleet*.

[483] Karl Mathiesen, "Russian intelligence accused of silencing Norwegian newspaper editor," *The Guardian*, 6 October 2015. Retrieved March 5, 2019.

compensation and become aware of their own rights as citizens.[484] However, as a result of Kutepova's persistent efforts to struggle for justice for these otherwise invisible communities, and her vocal opposition to the lack of transparency and accountability of PO Mayak and the Russian nuclear industry, Kutepova became a target of both local and federal authorities.[485] In this way, Kutepova faced repeated accusations of tax evasion, and ultimately, like Andrei Nikitin, she was accused of espionage and treason.[486] For this reason, in 2015, Kutepova and her four children fled Russia, as she was granted political asylum in France where she has tried to continue the work of raising awareness about unjust social and environmental conditions in the Southern Urals.[487]

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[484] *City 40*, directed by Samira Goetschel, D.I.G. Films, 2016.

[485] Brown, *Plutopia*; Thomas Nilsen, "Activist in exile says Norway's nuclear waste support is irresponsible." *The Barents Observer*, 7 June 2017, thebarentsobserver.com/en/node/2460. Retrieved May 28, 2019.

[486] Ibid.

[487] Nilsen, "Activist in exile."

CONCLUSION

My goals in pursuing this research on the social-environmental inequalities in the Southern Urals, specifically along the Techa River Valley, as a question of environmental injustice, included not only to contribute to academic literature on the history of social-environmental conflict in the Soviet Union, but to pursue questions for which there are no clear answers. What does history show regarding the appropriation of land in the Southern Urals before the construction of PO Mayak had even been planned? What did the Soviet production of space demonstrate about the possibility for equitable social relations in the Southern Urals? How did the Soviet state--established on principles of creating an emancipated, classless society, on dismantling inequality, racism/xenophobia, facism--justify and allow rural communities, largely of Bashkir and Tatar ethnic backgrounds, to bear the brunt of repeated accidental radioactive contamination, all while withholding vital information about the contamination itself as well as individuals' own medical records?

How did the United States justify withholding information about PO Mayak's 1957 "Kyshtym disaster" from the world, initially denying what the Central Intelligence Agency knew even after the geneticist Zhores Medvedev published his own findings to demonstrate when and where the radioactive explosion occurred, knowing that thousands of civilian human beings had been exposed to lethal levels of radiation exposure as a result of it? If socialism itself is to blame as the source of "ecocide" as many Western observers have portrayed the Soviet brand of environmental degradation, how is it that rural communities of the Techa River have continued to be exposed to radiation leaks, albeit not as extreme as the events from the first decade of PO Mayak's operation, almost

three decades since the dissolution of the Soviet Union? While some victims do receive some form of government compensation for radiation exposure, why are many other victims of radiation illness in the Techa River Valley still met with denials and stonewalling when they rightfully ask for their own compensation from the government?

These are all questions which fall within the scope of environmental justice. Today, residents of the Techa River Valley often express the lament that they feel forgotten. As Kate Brown has noted, Chernobyl became a household word, and the victims of that disaster have had opportunities to tell their stories in print and onscreen to audiences worldwide. When I have casually mentioned my research topic even to scholars of environmental studies, unless they already specialize in Russian environmental studies, they always respond that they had never heard of Chelyabinsk or PO Mayak. Therefore, despite the questions my research has left unanswered, by continuing to ask these questions, my hope is that it contributes to the antidote against toxic amnesia, and inspire others to continue asking these questions and demanding answers.

APPENDIX I: LETTER FROM MINISTRY OF HEALTH TO INSTITUTE OF EXPERIMENTAL MEDICINE RECOMMENDING RESEARCH TOPICS ON RADIATION ILLNESS

Ministry of Health USSR[488]

14 October 1955

№ 6358c

To the Director of the Institute of Experimental Medicine, AMN, Professor Biryukov, D. A.:

I am sending recommendations for the construction of the scientific research plan for 1956-1957 regarding radiation illness and combined impacts on organisms.

With these recommendations in mind, I ask that you plan research projects on this problem for 1956-1957, and that you incorporate this into the work plan for your institute, and I ask that you to present this plan by 10 November 1955 to the Department of Medical Radiology of the Ministry of Health on the specified recommendations while taking into account the work that has been completed on this topic at your institute in 1955.

Head of the Department of Medical Radiology: E. Vorovyov.

Recommendations for construction of the scientific research plan on the problem of radiation illness and combined impacts on organisms, 1956-1957.

The complex of problems relating to injuries and illness associated with atomic weapons in our time takes on special, important significance. Primary attention in addressing this problem should be oriented towards scientific research and practice, taking into account its relevance to defense and its critical importance to life itself. Listed below are exemplary topics for scientific research to be developed in 1956 to 1957.

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[488] My English translation of the letter from E. I. Vorovyov, Chief of Dept. of Medical Radiology of the Ministry of Health, USSR, to D. A. Biryukov, Director of the Institute of Experimental Medicine of the Academy of Medical Sciences, USSR.

I.

1. Development of shock under conditions of the first period of radiation illness. Measures to prevent it, first aid, and follow-up treatment.

2. Shock during the later stages of radiation illness. Prophylaxis and treatment for it.

II.

3. The duration and treatment of internal cranial injuries during radiation illness (bruises, concussion, contusions).

4. External cranial injuries under conditions of radiation illness. Special considerations regarding duration and treatment.

5. Trauma to the face and jaw during an atomic attack. Special considerations regarding the sequence of manifest injuries, and treatment under conditions of radiation illness.

III.

6. Internal injury of organs within the chest cavity. Special considerations of treatment during radiation illness.

7. Penetrating wounds of organs in the chest cavity. Duration and treatment under conditions of radiation illness.

8. Internal injury of organs within the abdominal cavity and their duration under conditions of radiation illness.

9. External injuries affecting organs within the abdominal cavity and their treatment under conditions of radiation illness.

10. Weakness and tremors affecting the organs of the body. Special considerations of their duration and treatment under conditions of radiation illness.

IV.

11. Internal bone fractures and their treatment during radiation illness.

12. External bone fractures and their treatment during radiation illness.

13. Development of osteomyelitis [bone infection] under conditions of radiation illness.

14. Methods of speeding up bone tissue regeneration after fractures in the context of injuries resulting from ionizing radiation.

15. Immobilization of transportation and the combination of impacts under the conditions of an atomic attack.

16. Infectious fractures and their duration under conditions of radiation illness.

17. Combinations of antibiotics to be administered under conditions of trauma and radiation illness.

18. The effect of vitamin B6 and B12 upon the regeneration of bone tissue during radiation illness.

19. Injury of peripheral nerves. Duration, regeneration, treatment to preserve neural tissue and surgery under conditions of radiation illness (initial and delayed sutures).

V.

20. Special considerations of the duration and treatment of wounds on various parts of the body under conditions of radiation illness.

21. Microbial flora of wounds during radiation illness.

22. Duration of anaerobic infections under conditions of radiation illness (tetanus, gas gangrene).

23. Effect of denervation during the inflammatory process and regeneration of tissue during radiation illness.

24. First treatment of wounds during radiation illness.

25. First treatment of complex wounds.

26. Delayed treatment of wounds under conditions of radiation illness.

27. Follow-up suturing of wounds under conditions of a combination of injuries.

28. Antibiotics during the treatment of wounds and radiation illness.

VI.

29. Burns and radiation illness. Special considerations of their duration and treatment.

30. Blood and plasma transfusion for burns under conditions of radiation illness.

31. Transfusion of blood replacement fluids for burns under conditions of radiation illness.

32. Special considerations regarding the duration and treatment of burns in cases of a combination of injuries and radiation illness.

33. Administering vitamin B12 for burns during radiation illness.

34. Effectiveness of necrolytic agents for the treatment of third degree burns (trypsin, pepsin, streptokinase, streptodornase, etc.) including for the treatment of burns associated with ionizing radiation.

35. New methods of accelerating the treatment of deep burns.

36. Grafts of preserved tissue for homoplastic replacement of skin injuries and other tissues.

VII.

37. Administering vitamin B12 for a combination of injuries and radiation illness.

38. Parenteral application of protein treatments and protein hydrolysate formulas for a combination of injuries, burns, and radiation illness.

39. Transfusion of blood and blood replacements for a combination of injuries and radiation illness.

40. New blood replacement fluids for the treatment of radiation illness and a combination of injuries.

VIII.

41. Principles of first aid, triage, and evacuation during an atomic attack.

42. Medical assistance during the evacuation stage during an atomic attack.

In terms of the planned research topics regarding radiation illness in combination with injuries, external and internal radiation under conditions of radioactive substances entering an organism and causing radiation illness should accordingly be kept in mind. The development of treatments and prophylactic measures for wounds and burns on the body contaminated with radioactive substances is also of extreme importance.

Annotation format for the plan:

1. Name of institution

2. Title of problem and topic

3. Scientific lead and laboratory executer for the project (academic level, title, last name, initials)

4. Short summary of work on the topic, answering the following questions:

a) research objective

b) To what extent has work on this topic been completed so far (for those which have already begun in 1955, briefly specify the results obtained so far)

c) Methodology

d) Research site

5. Timeline for the research project

Head of Department of Medical Radiology, Ministry of Health, USSR, Vorovyov

LIST OF ARCHIVES AND COLLECTIONS

Russian Federation

ARAN, Archives of the Russian Academy of Science (*Arkhiv Rossiiskoi akademii nauk*), Moscow. Fond 1729: Collection of archival material corresponding to Mstislav Vsevolodovich Keldysh (1911-1978), mathematician who specialized in mechanics and aerohydrodynamics, served as Vice President of the Academy of Sciences of the USSR 1960-1961, and as President, 1961-1975.

CGANTD SPb [alternatively, TsGANTD SPb], Central State Archives of Scientific-Technical Documentation of St. Petersburg (*Tsentral'nyi gosudarstvennyi arkhiv nauchno-tekhnicheskoi dokumentatsii Sankt-Peterburga*). Fond R-182: Collection of archival material corresponding to the Institute of Experimental Medicine.

OGAChO, Joint State Archives of Chelyabinsk Oblast (Ob"edinennyi gosudarstvennyi arkhiv Cheliabinskoi oblasti), Chelyabinsk. Fond R-76: Collection of personal archives corresponding to the economic geographer, Fyodor Yakovlevich Kirin; Fond R-274: Collection of archival material corresponding to the Council of the People's Deputies of Chelyabinsk Oblast and their executive committees (1934-1993).

United States

E. Gail De Planque Papers (EGDP), Hoover Institution Library & Archives, Stanford University, Palo Alto, CA.

Victor Galinsky Papers, Hoover Institution Library & Archives, Stanford University, Palo Alto, CA.

Pavel Oleinikov Papers, Hoover Institution Library & Archives, Stanford University, Palo Alto, CA.

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