Thinking of Water as a Material Witness: An Attempt to Fill the Voids in the Archive of the Moscow Canal (1932–37)

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This essay revisits the Moscow Canal and explores the water in the trapezoid hollow as matter that bears witness to the violence experienced by human and nonhuman actors during the waterway construction between 1932 and 1937. By attending to the canal's flow, I argue that water can operate as an alternative archive, adding to more conventional forms of documentation, and suggest three functions that it can perform: registering, disclosing, and preserving traces of power abuse. These traces provide ways in which archival voids of the hydraulic project can be illuminated and possibly restored. To deliver this argument, I begin by contextualizing the Moscow Canal within the narrative of Soviet industrialization during the 1930s. I continue by providing a brief overview of the methodologies developed in the field of Gulag studies and situate the idea of "material witness" within them. Then, I look into the waterway's flow and examine its registering capacities by studying the canal's technical organization, describe its disclosing capacities by exploring the submerged town of Korcheva, and analyze its preserving capacities by discovering erratic underwater graveyards.

The Moscow Canal, which the Soviet politician Lazar Kaganovich referred to as "the blood brother" of the region's first metro line,[1] was one of the earliest projects of Soviet industrial development, part of the major renovation of Moscow in the 1930s. Most of its construction works were executed by the people sent to the Gulag correctional imprisonment system[2]—criminals, dispossessed peasants, racialized bodies, settlers, political prisoners, and others[3]—and coordinated by the Dmitrov Correctional Camp. Between 1934 and 1936, its busiest period, Dmitlag[4] supervised more than 190,000 inmates.[5] The latest death toll counts report 22,842 lost lives;[6] many independent researchers

note that this figure does not encompass individuals who were assassinated or who passed away at work or while escaping from Dmitlag.[7] Together with deforestation, swamp draining, river rerouting, and multiple other forms of brutal environmental reorganization, the inmates' forced labor enabled the construction of the canal.

The shift to water as an alternative register of exploitation and power abuse is proposed for several reasons. First, most of the documents produced at the Dmitlag camp remain missing. While the historian of the Stalinist period Oleg Khlevniuk argues that around 90 percent of the archive was winnowed in preparation for the World War II evacuation,[8] the former chief power engineer of the canal, Valentin Barkovsky, suggests that records were burned during the evacuation.[9] Second, accessible archival materials reveal ideological constraints that informed their organization. Though they persist as the primary source of information about the Gulag network, some suffer from distortion.[10] Third, state institutions continue to keep some documentation classified without providing details about its condition.[11]

Based on the available materials from archives, Soviet publications,[12] oral histories, field research, and other sources, Russian-based local historians have retrieved various histories of the Moscow Canal.[13] Although they continue to be the only active group that explores the waterway and former construction site, their work reproduces violence inherent to the narrative of Soviet industrialization.[14] Building on this work, the scholar of Soviet prewar culture Cynthia Ruder provides a detailed description of the canal in *Building Stalinism: The Moscow Canal and the Creation of Soviet Space*, which remains the only monograph about the hydraulic project.[15] Ruder brings together official documents, historical and literary accounts, and art objects to expand the canal's narrative. She argues that this body of water was exemplary of "a Soviet space"[16]—a conceptual proposition that Ruder develops to describe the construction of the Soviet state through the practice of placemaking, relying primarily on Henri Lefebvre's work on space. Yet, despite meticulous work with the artifacts, Ruder does not provide critical commentary on their content and therefore situates her study within similar constraints.[17]

In attempting to bypass limitations that characterize both archives and research publications, a turn to the waterway as an assemblage of material agents may be helpful. Owing to its critical role in providing the capital city with water and electricity, the body of the canal has experienced only seasonal maintenance, which suggests that the traces of industrial transformations have been preserved for more than eight decades. Using the idea of "material witness" developed by the artist-researcher Susan Schuppli as a framework for this essay, I argue that some of these traces can be reconstituted by looking into the flow of the canal's waters. As an operative concept, "material witness" proposes to produce new forms of knowledge by examining "nonhuman

entities and machinic ecologies that archive their complex interactions with the world."[18] Drawing on this proposition, I seek to explore the evidential agency of water not simply as visual representation and justification of the events that happened at the construction site but as "entanglements of materials [that] activate their narrative potential" and therefore expose the constraints of the dominant modes of narration.[19]

While approaching a body of water as a potential archive, I engage with the academic work of the researchers who investigate European colonization of the Americas. By referring to this scholarship, I propose a different methodological approach to the Gulag network—that which examines the imprisonment system as a mode of coloniality produced and perpetuated by the Soviet state between the late 1920s and the 1960s.[20] This approach opens new ways to address the Gulag as a political, economic, social, and cultural system, challenging already developed research framings, such as the Gulag as a penal institution,[21] comparative studies of the Gulag and the Holocaust,[22] and the Gulag in memory studies,[23] as well as contributing to these discussions. However, I do not suggest inscribing Gulag histories into a preconceived rubric. Rather, I call for expanding the notion of coloniality to account for the Gulag variable.

Situating the Moscow Canal within the Soviet Industrialization of the 1930s

The Moscow Canal is an engineered body of water that connects the Volga, the country's major waterway, sprawling for more than 3,500 kilometers across its western part, with the Moskva River that traverses Moscow, which used to be the capital of the former Russian Soviet Republic and the Soviet Union. It runs for 128 kilometers starting from the Ivankovo Reservoir, also known as the Moscow Sea, along the town of Dmitrov to the southwest of Moscow (fig. 1), as the map found in one of the technical reports shows. However, back in the 1930s, the Soviet government imagined the water flowing in the opposite direction—from the capital city to the rural areas. The ambition to deliver a new industrial lifestyle to remote areas by means of the waterway was captured in its original title, the Moskva-Volga Canal.[24]

This industrial lifestyle was introduced to transform the agrarian state into a powerful modern empire—a socialist opponent to the capitalist system—and to urbanize the territories. To achieve the transformation of the state economy, a series of Five-Year Plans were implemented, each designed for a particular goal.[25] Forced industrialization, with heavy industry, steel, and machine building as priority fields, and collectivization remained the main objectives for the Second Five-Year Plan, which involved the construction of the

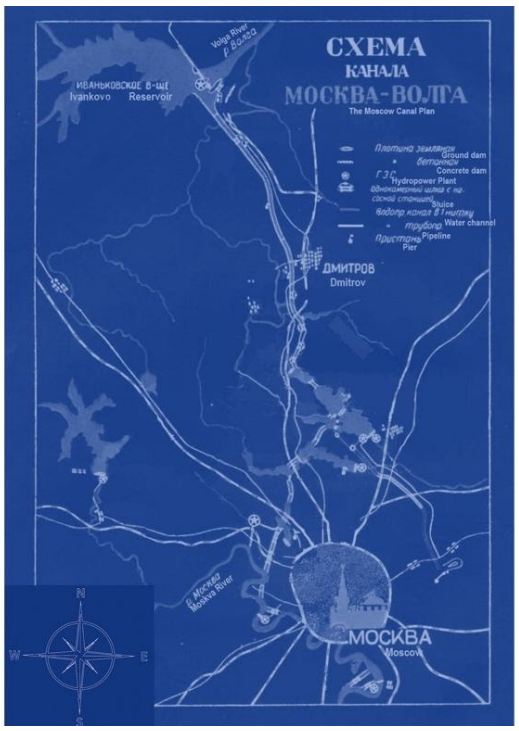

Figure 1 The Moscow Canal plan, 1940. Original image courtesy of the Gosudarstvennoe izdatelstvo stroitelnoy literatury (State Publishing House of the Construction Literature). Image edited by the author.

Moscow Canal. The waterway contributed to the development of megaprojects—referred to as the Great Construction Projects of Communism—which encompassed large-scale industrial infrastructures such as Dnieper Hydroelectric Station, Ural metallurgical combines, and White Sea-Baltic Canal, all built during the prior five-year program.[26]

While experiencing changes brought by rapid industrial development, Moscow, as the capital, became exemplary of them. The General Reconstruction Plan of the City, approved in 1935, reflected these changes by suggesting a renovation of the cityscapes. The plan included reorganizing residential areas, expanding the railway network, creating highways with new modes of transport, and constructing bridges and other urban infrastructures.[27] Among these transformations, granite embankments were of special importance because Moscow was envisioned as a harbor city with the Moskva River as its artery, which a photograph found in the General Plan publication illustrates (fig. 2).

Together with population and city growth, the renovation project exhausted the capital's water resources, and some areas of the Moskva River dried up. The Moscow Canal was built to resolve this problem and sustain the city with both technical and domestic water, therefore ensuring further urban development. Its construction also aimed to increase the production of hydroelectricity, taking the GOELRO plan further,[28] by building eight hydropower

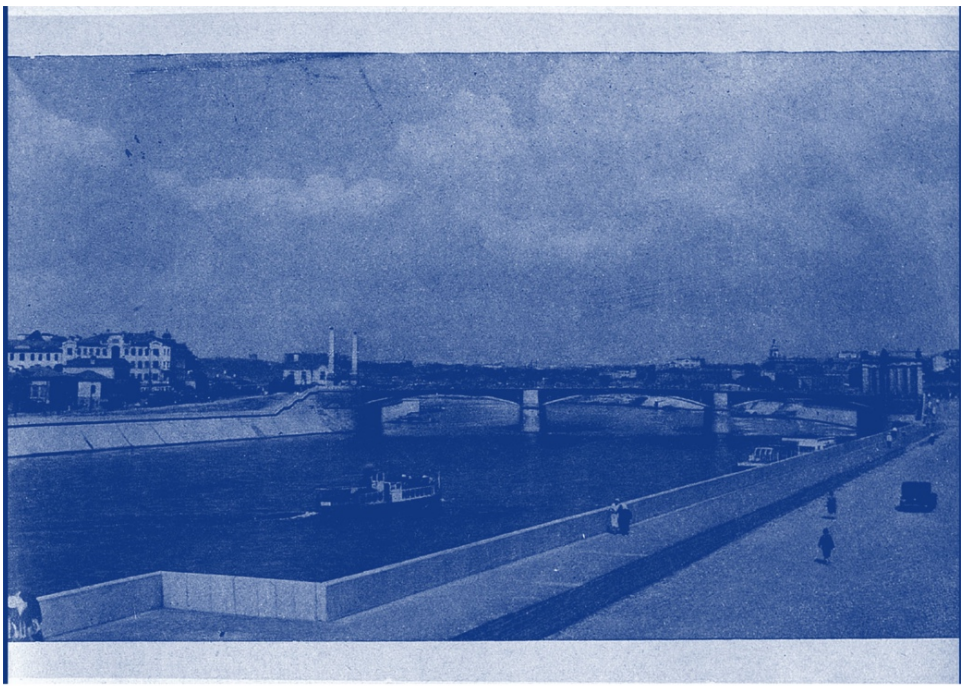

Figure 2 The renovated embankment near Borodinsky Bridge, 1936. Original image courtesy of Poligraphkniga. Image edited by the author.

plants on the canal's flow. The waterway was planned to facilitate the transportation of raw materials, such as oil, coal, and wood—the outcomes of forced industrialization—and to accompany the railroad, which was a more expensive means of transportation.[29] The size of the canal had to accommodate this flow of resources, especially oil tankers that carried up to twenty-two-thousand-ton loads.[30] It was designed in the shape of a trapeze: 85.5 meters wide on the surface and 46 meters on the bottom, reaching 5.5 meters deep (fig. 3).[31]

Besides economic reasons, ideological advantages also stimulated the construction of the canal. The capacity to master nature and put it to the service of industrialization became an important ideological framing, with every conquest demonstrating the strength of the Soviet state.[32] Particularly successful was the completion of the projects that were left unfinished during the imperial rule, since they emphasized the advantage of Soviet power. Under this framing, water was imagined as a savage, uncontrollable force that required taming as well.[33] The Moscow Canal constituted one of the largest projects that demonstrated how water can be civilized—Moscow as a Port of Five Seas. This endeavor sought to create an inland waterway system that connected the land-locked capital with remote territories of the country through five seas: the White, the Baltic, the Caspian, the Black, and the Sea of Azov, and therefore enabled control over them and reinforced the dominant position of Moscow, both strategically and symbolically (fig. 4).

Figure 3. The trapezoid waterway bottom of the canal, 1936. Original image courtesy of Typo-lytographia imeny Vorovskogo (Vorovskoy Printing House). Image edited by the author.

To insert the new industrialized rhythm into daily life, a new temporality was instituted. Beginning with the events of 1917, time was thought to follow a linear progression oriented toward an imagined communist future, with the present being a transitionary stage divided into a consecutive series of five-year programs. Acceleration became its vital characteristic. The urge to reach and bypass the development of other empires in the fastest possible manner required this temporality to move more rapidly and outstrip itself. The flow of time, already set to industrial rhythms, was to quicken further and outrun its own limitations, therefore increasing the productivity of modernization.

Situated within this temporal orientation, the project of the Moscow Canal struggled to follow the accelerated pace. Originally, the construction works were planned to terminate between 1932 and 1934.[34] Based on the successful completion of the White Sea Canal—the northern part of the Port of Five Seas project (fig. 4)—in less than two years, engineers estimated that the Moscow Canal would meet the same deadline. However, by 1934 the organization of works proved to be dysfunctional: it was at least twice less productive than expected.[35] Yet the dysfunctional management was not restructured. Instead, the construction site was sustained with the incessant flow of various resources, primarily human labor.

The refusal to improve the project's management indicated that the canal was no longer imagined as a strategic body—a time-limited innovative project that required advanced technological tools and skills to operate them in the most efficient ways. Rather, it was adjusted to a time-stretched absorber of resources, both human and nonhuman, distributed unrestrainedly to the

Figure 4 Map of the Moscow River as a Port of Five Seas Project. Original image courtesy of Riverflot.ru. Image edited by the author.

waterway and without an outlined plan. When discussing the development of modernity, Stefano Harney and Fred Moten argue that its origins have been marked by the shift to the logistics organization that enables ceaseless commodity supply to the site of production. They continue by saying that the core of every modernity lies in this movement of "things, unformed objects [and] deformed subjects,"[36] what they define as "the hold"[37]—bodies and entities, including humans, animals, energy flows, and other exploitable materials that are being shipped and containerized for the benefit of capital. To adapt this thinking to Soviet modernity,[38] the "hold" of the Moscow Canal would be composed of bodies and entities delivered to the Dmitlag camp.

Initially, Moscow's administration oversaw the hydraulic project, but already in 1932, its supervision was passed to the ministry of home affairs.[39] Operating mainly as a policing body, it regulated the Gulag network, which sought to sustain rapid economic and political development of the state by exploiting forced labor of the inmates, cheap and unlimited, since their bodies could be distributed and redistributed across the country once needed. When the management crisis occurred at the Dmitlag, the number of workers tripled from 50,000 to 150,000.[40] However, this measure failed to accelerate the construction of the waterway. The termination of works was postponed twice, allowing the navigation to begin only in mid-1937, three years later than scheduled.[41]

Situating the Concept of "Material Witness" within the Studies of the Gulag Camps

As Leonid Borodkin observes, the Gulag network was organized as a highly bureaucratic structure.[42] The daily life of convicts was explicitly recorded to monitor their productivity. According to a document found in the Russian State Archive, these records were arranged based on their expiration date and grew into complex storage systems, with some materials kept at the camps and others in the main directorate of the Gulag.[43] However, as many scholars emphasize, most of the files were classified until the early 1990s.[44]

Prior to the "archival turn" in Gulag studies activated by official decree in 1992,[45] oral histories, diaries, memoirs, and other literary accounts served as the main forms of information about life enclosed within the thick walls of the camps. Works by imprisoned writers Aleksandr Solzhenitsyn and Varlam Shalamov are among the most well-known texts that describe living and working conditions at the Gulag. In *Kolyma Tales*, Shalamov writes:

> Envy, like all our feelings, had been dulled and weakened by hunger. We lacked the strength to experience emotions, to seek easier work, to walk, to ask, to beg. . . . We envied only our acquaintances, the ones who had been lucky enough to get office work, a job in the hospital or the stables—wherever there was none of the long physical labor glorified as heroic and noble in signs above all the camp gates.[46]

Yet many writers and poets left descriptions of their imprisonment.[47] The publication of personal correspondence, memoirs, autobiographies, and other forms of personal memories that narrate camp histories started in the mid-1950s and intensified in the late 1980s and early 1990s.[48] These materials represent an important source of knowledge about the Gulag network, as they depict the experience of convicts that is missing in the archival documentation. Still, some of them lack accuracy, while others remain constrained by the traumatic experience that is central to their plot.[49]

The opening of archives fostered monographs and papers that introduced particular research strategies. These strategies approached the archive as a collection of statistical and numerical data invoked to support an argument, without considering its politics and analyzing its systems of order and preservation. Simon Ertz points to the inconsistencies that such strategies produce. While working with paper-based documentation and comparing it with other forms of evidence, Ertz notices that the signed orders sometimes significantly differed from the orders given at the Gulag camps. He challenges the credibility of the files and proposes the search for additional proof, of another char-

acter, to validate the documents before referring to them in research publications.[50] Therefore, activation of archives requires problematizing their organization and operation, as otherwise the violence enacted in their structures can be reproduced.

In this gap between personal accounts and the archive, "material witness" becomes instrumental. Schuppli borrows this concept from the legal context to explore matter as an active and expressive witness and analyzes institutional protocols that render certain orders of knowledge legitimate while dismissing others. Drawing on the notion of "informational enrichment" by Andrew Barry,[51] who develops it further from Isabelle Stengers and Bernadette Bensaude-Vincent, Schuppli emphasizes the possibility of reading histories from the material strata of things in order to contest existing narratives by interpreting "informed materials."[52]

Schuppli's proposal to attend to matter without metaphorization and compose new histories challenges common research approaches to archival materials where they are considered as records that prevail over other forms of documentation. Instead, it refers to matter as the primary resource mediated by archival files. To do so is to approach water as an assemblage of nonhuman entities and to think through and with its properties, movement, and other parameters, following the work of scholars like Astrida Neimanis, Melody Jue, and Stacy Alaimo.[53] This turn allows us to engage with the Moscow Canal as a material and political body that can register and accumulate information. It provides new ways to retrieve the histories of the Gulag, where the water flow appears as an informative resource, capable of revealing artifacts overlooked by both personal accounts and archival documents.

The Flow of the Moscow Canal

Flow is the motion of water in its liquid state. It is mainly generated by gravity but can also be produced by factors such as wind, salinity, and temperature differences. The flow defines the organization of a body of water, be it an ocean, a sea, a mountain river, or a lake. It varies in speed, direction, and intensity, and, as Stefan Helmreich argues, these qualities require different accounts—those that recognize the parameters of salt and fresh, still and moving waters—to capture and describe the heterogeneity of the aquatic spaces.[54] The flow allows nonhuman inhabitants and human residues to connect through the water as well as to remain concealed by its layers and preserved by its chemical properties. Understood by fiction and scholarly literature in its materiality, not as a metaphor,[55] it makes the aquatic a flexible and mobile space resistant to mastery due to its fluid nature.

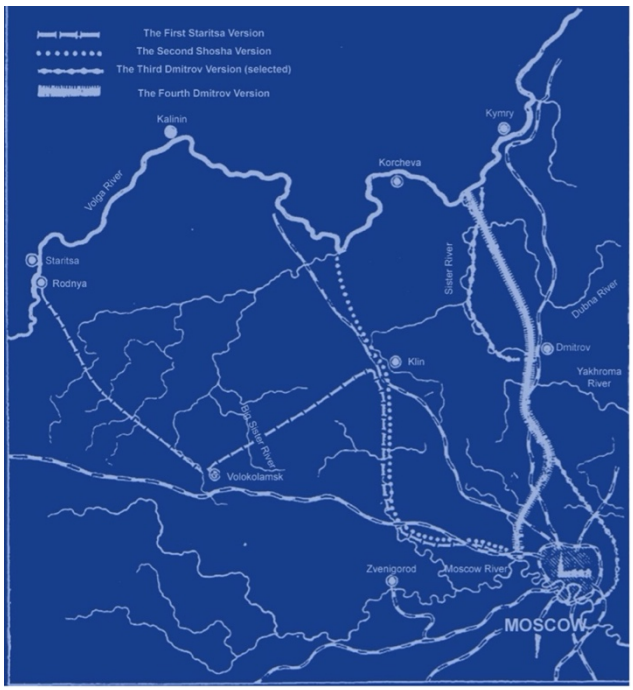

Figure 5 Comparative map of the Moscow Canal pathways, 1940. Original image courtesy of Typo-lytographia imeny Vorovskogo (Vorovskoy Printing House). Image edited by the author.

In contrast to the bodies of water that are shaped by the flow produced by inherent elements, their artificial analogues—canals—emerge in a cyborgian manner: they are half natural and half human-made. Canals may appear anywhere the land can be excavated and water transported to create a flow—here meant metaphorically—of power. The hollow spaces are being filled with standing water, as in a reservoir. To repossess the dynamism, the waterway should be sustained by the external structures, such as dams and sluices. The water masses need to be transported up and down and passed through various gates in order to become mobile again. Their amount should be carefully monitored, otherwise the cyborgian body of a canal may be injured by floods, mudflows, and other obstructions. Their schedule should be accurate too. If the tainter gates are not opened on time and the water does not reach the required level, the navigation may be damaged.

The Moscow Canal is an artificial body of water—only nineteen kilometers of its way is unaltered by human engineering. This route was selected out of the three possible paths as the most cost-effective, saving the construction and maintenance expenses and shortening the distance between Moscow and the towns of Saint Petersburg and Nizhny Novgorod, as a comparative map of the canal pathways demonstrates (fig. 5). Yet topographically it was the most challenging option. The canal commences in swampy lowlands, proceeds through steep slopes and ravines, then continues in the forests and descends to the meadows where it flows before arriving at the capital city. To

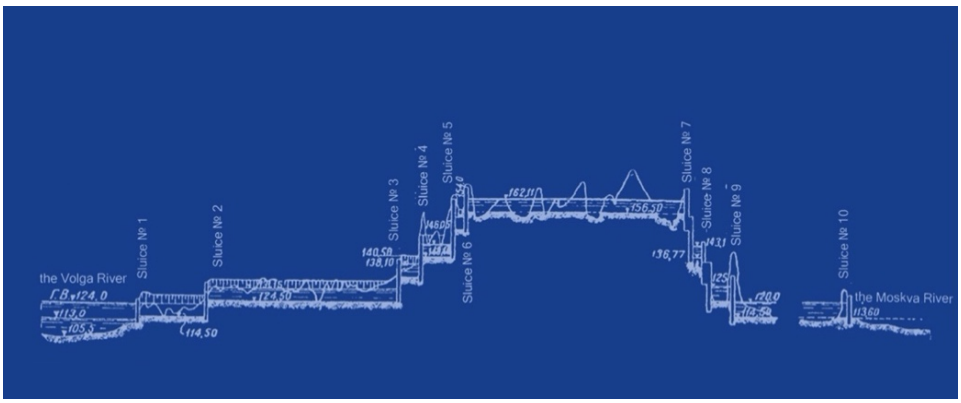

Figure 6 The topographical profile of the canal, 1936. Original image courtesy of Typolytographia imeny Vorovskogo (Vorovskoy Printing House). Image edited by the author.

enable the running of water, these elevation differences—with some of them reaching seventy meters[56]—were balanced by various mechanical units (fig. 6). In total, 240 structures were built to maintain the water flow.[57]

Since the running of the canal results from complex geophysical calculations and engineering efforts, it is worth looking into the structures that enable the artificial flow to consider their organizational patterns as forms of documentation that have recorded violence at the construction site and have preserved these traces in ways alternative to the archive.

The Flow and Environmental Infrastructure: A Capacity to Register

If the water masses flow, they have a direction. They can go upstream or downstream, turn left or right. Regardless of how twisted their path is, or what obstacles occur on their way, the masses will still be directed to a particular point where they connect with other bodies of water. Their course can be visible, as in rivers, or obscured, as in underwater currents. However, once the landscapes that they traverse become engineered, reorganized by external forces to extract resources, the flow of waters encounters disturbance too. It might weaken, shallow, and dry up. It might also gain power, break from its banks, and cause floods. These forms of adaptation to the rebuilt environments register human interventions, keep traces of the transformations in their bodies, and therefore perform witness in the redesigned modes of operation.

In late April, when the navigation season begins, the Moscow Canal, half empty after the winter period, is refilled by the Volga. The waterway interrupts the river on its right side, 370 kilometers away from its source, close to the Dubna River inflow. The old maps, produced before this area was reshaped to accommodate the canal, show that originally the Volga ran along the town of Korcheva, then descended to the village of Ivankovo and from there went upstream to reach the town of Rybinsk (fig. 7). However, this path was

Figure 7 The map depicting the flow of the Volga River before the Moscow Canal construction, 1892. Original image courtesy of Izdaniye tverskogo gubernskogo zemstva (Publishing House of Tver Provincial Zemstvo). Image edited by the author.

rerouted. Near Ivankovo, the flow was divided into three separate streams (fig. 8). One continued the original route to the north toward Rybinsk, another proceeded directly to the first sluice of the canal, and the third descended farther to the south, merging with the human-made waterway.

The rerouted path required external mechanisms to facilitate the flow. These mechanisms transformed the bottom and banks of the Volga. For instance, its riverbed was widened and elevated to create the Ivankovo Reservoir—or the Moscow Sea—where the waters were stored. After being modernized, the Volga could no longer sustain itself. The river became dependent on the restraining elements that reorganized its environments. Stefan Helmreich proposes to analyze such industrial interventions into the natural worlds as environmental infrastructures, which he calls "infranatures."[58] Helmreich introduces this idea to revisit the boundaries established between the "natural" and "the artificial" and analyzes how these categories might be assembled in a different way.

In his proposition, Helmreich shifts from thinking about "the first 'organic' nature" as supplanted by the mechanical structures and observes their collaborative, engineered forms.[59] Yet he does not seek to point to the impotence of the natural worlds. Rather, he suggests that once intruded on, they obtain new "technologies" that become their immanent "techniques,"[60] therefore transforming "the putatively natural order of things."[61] In an "infranature," processes that are considered natural to a particular environment are involved in an expanded infrastructure that maintains systems of control and communication and enables the movement of various bodies and material flows. The production of hydroelectricity at the Ivankovo Hydropower Plant

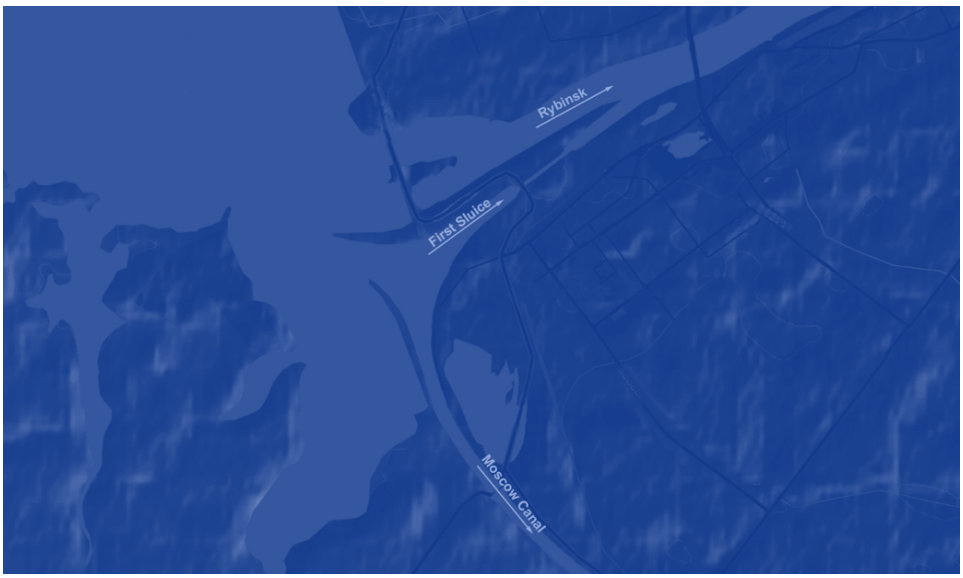

Figure 8 The map depicting the Volga River rerouting. Image courtesy of the author.

is an example of how the technologized Volga River operates as an "infranature." While the water masses run in the adjusted riverbed—a "technique" inherent to the waterway—they turn into an operative entity that produces electricity and thus implicitly become constituent of a complex industrial process. Though the outcomes of such an "infranature" might be immediate, the consequences of the interventions may take longer to emerge, and natural environments would be the first to signal the changes.

The completion of the Moscow Canal was celebrated as the major success that demonstrated the capacity of Soviet industrial culture to master natural worlds.[62] This "achievement," to use the official language of the 1930s, enhanced the dominant narrative of development and, in particular, the urgency to urbanize territories and bring them to the service of Soviet modernity. However, looking at this complex structure as an "infranature" allows its insufficiencies to be registered too. Besides illuminating the exploitation of various resources, this conceptual proposition recognizes the core aspect that ensures the functioning of the canal: maintenance. "Infranature," like any other infrastructure, fails to operate as intended without regular maintenance. If abandoned, technologized natural worlds lose their acquired "techniques" and begin to malfunction in an environment that was reconfigured by and for the industrial infrastructure. They mutate as did the Ekaterininskiy Canal, an earlier attempt to connect the Volga and the Moskva Rivers, which was built between 1820 and 1844. Today it exists as a semidrained creek overgrown with reeds and other vegetation, illustrating the fragility of an "infranature" rather than its durability (fig. 9).

Figure 9 The Ekaterininskiy Canal today, 2020. Original image courtesy of Arseny Khakhalin. Image edited by the author.

The Flow and the Geologic Fossils: A Capacity to Disclose

Besides running on the horizontal axis, from the source to the mouth, the flow stays operative in the vertical dimension too. At various depths, aquatic environments are organized in different ways, with each layer inhabited by particular living organisms. While the water masses rise and fall depending on various factors, including abundant precipitation and droughts, the artificial flow has no control over its oscillations. Instead, sluices, dams, and other mechanisms regulate the motion of the waters. They are delivered and pumped out to provide certain services like navigation, which disturb underwater communities. If the level goes below the required point, these communities are exposed to new environments, which they would not encounter otherwise. The flow discloses what is concealed by the watery layers, bringing to attention artifacts that lie on its bottom.

Returning to the area where the Moscow Canal branches off from the Volga, two islands—less than a couple of meters in their diameter—unexpectedly appear (fig. 10). When the water level is slightly lower than usual, these islands grow and become more noticeable. Together with the fragments of the bricked embankment covered today with bushy greens, a desolate house on the right bank of the river and other remnants of life such as coins constitute the residues of Korcheva, a town that was submerged for the purposes of the canal. First inhabited between the eighth and twelfth centuries,[63] Korcheva was populated by around five thousand people in the late 1920s.[64] Historical accounts depict Korcheva as a town that reminded many of a village.[65] However, it had a regular plan, developed infrastructure, including factories, educational institutions, a hospital, and three cathedrals, with two built of stone—unusual

Figure 10 Two islands discovered in the Moscow Sea, 2020. Original image courtesy of Den Solotareff. Image edited by the author.

elements of the architectural ensemble, since wooden churches were more common in semirural areas (fig. 11). Still, it was not as large and busy as other towns on the Volga, such as Rybinsk and Yaroslavl, with which Korcheva was connected via roads.

However, for the Moscow Canal, intent on reshaping the existing pathways and introducing new modes of transport, Korcheva was an obstacle. It occupied the territory arranged for the Ivankovo Reservoir, thereby hindering the construction of the waterway. Given the size and organization of the town, incomparable to that of the canal, it was drowned to free the way for the industrialized water. For its residents, this intervention resulted in displacement. People were forced to move to the villages and small towns nearby, with some wooden houses transported by steel tractors while others, primarily built of stone, were demolished.[66] However, propelled by the acceleration imperative, Soviet modernity rushed the decision to submerge Korcheva and miscalculated the amount of land for flooding. When the water filled the canal's bed in 1937, one third of the town was left outside the watercourse.

Though Korcheva remains underwater, the two islands and other residues of the town are frequently disclosed by the flow of the canal. While the documents that registered the drowning and residents' accounts of this event remain missing, these residues act as fossils within the geological materiality, to refer to Kathryn Yusoff's terminology. Yusoff imagines fossils as "left-over forms of organisms and creatures that no longer have belonging in the world"[67] and argues that besides leaving traces that keep historical records, fossils also "attest to the inverse of [this] which is the outside genealogy, of leaving no trace."[68] She proposes approaching them in search of the missing archives to reconstitute the histories folded in and by them "for the possibility of others"[69]—those suppressed by the normative modes of narration. In the case of Korcheva, studying the residues of the town empowers the shift from the industrialization narrative, which disregards any experience outside the idea of progressive development, to the stories of "the others," residents and their

Figure 11 The town of Korcheva, 2005. Original image courtesy of S. I. Kurdin. Image edited by the author.

relatives, nonhuman assemblages who endure the existence of the town, both above and below the water surface. For instance, until 1993 former residents met and traveled together to Korcheva by boat every year.[70] There, people passed by the streets and revisited places where the churches and other destroyed buildings were located, acknowledging and prolonging the life of the town.

Yusoff adds that geological fossils operate as "empirical knots of time,"[71] which in the absence of corresponding experience allow for speculative stories and therefore push us to think about the future differently. This approach breaks away from the linear passage of history and time and challenges imaginaries of the future that rely on progressive narratives. Thus, reading the traces produced by fossils—like the peaks of the two islands found in the Moscow Sea—is a practice not necessarily of justifying or refuting certain events, as the work with archival documentation suggests. Rather, it is a practice of world making where the experiences of "the others" are retrieved in the present to allow for other futures.

The Flow and the Weather: A Capacity to Preserve

Together with the function of disclosing that activates when the water is below a certain level, the artificial flow has the capacity to preserve nonhuman agents and residues that circulate in the aquatic motion or lie on the bottom of the waterway. The physical and chemical properties of various bodies that inhabit different depths interact in the watery space. They share common environ-

ments and leave traces of coexistence in their bodies. These traces remain discernible as long as the residence time of particular elements—for instance, calcium—allows them to stay in solution. Therefore, any activity that involves a body of water becomes archived and settles in as a residue. In the absence of documents and artifacts, such residues might operate as evidential matter, which also appear to be a more durable form of documentation, as the case of the Moscow Canal illuminates.

In his memoirs, Valentin Barkovsky noted that the Moscow Canal had preserved a particular group of residues, disclosing them to a smaller group of people.[72] These residues were found near sluices and other external structures that were considered to be of military importance. For that reason, they were guarded and accessible only to the employees of the canal, like Barkovsky. He wrote that the residues appeared only when the soil was washed away from the bulk banks by the water streams, which happened rather frequently. These streams disclosed bones of the convicts who passed away at the construction site without being officially registered and included in the death toll. Their bodies were thrown in pits organized erratically around the waterway, as many local historians have described and as the residues have illuminated.[73] Many similar mass graves have been discovered along the canal. As Barkovsky recalls, some were found unexpectedly in the 1970s, during the excavation works for the public amenities in Moscow.[74] Such mass graves were left undocumented to conceal the mortality level and other adverse information about the Dmitlag.

The pits were built to manage an increasing number of exhausted bodies that facilities designed to handle human remains could not accommodate (fig. 12). Treated as a disposable force, Dmitlag convicts executed around 55 percent of the workload, including soil extraction, swamp draining, and forest destruction.[75] Combined with lack of the equipment—mechanical tools appeared at the construction site in late 1934—and austere living conditions, extreme workloads resulted in fast exhaustion and debilitation. These measures operated as what Christina Sharpe calls "weather,"[76] produced intentionally at the Dmitlag to enable control over the inmates and ensure their productivity. Discussing violent environments that have supervised the life of Black bodies, Sharpe proposes an expansion of the meteorological notion of weather to consider socioeconomic, political, and cultural conditions— "a total climate"[77]—produced to "allo[w] certain communities to thrive and others to completely languish."[78]

While acknowledging the differences between the experiences of the enslaved people of African descent in the United States and that of the people imprisoned at the Gulag, Sharpe's proposal offers a way to think about policy-making as a material practice that sediments in various bodies. In such terms, the "weather" of the Moscow Canal was designed to ensure rapid industrialization of the country and sustain exploitation of the bodies at the Gulag by

Figure 12 Map indicating a mass grave between sluices number 6 and number 7, 2007. Image courtesy of Valentin Barkovsky.

means of multiple measures, such as workload, poor diet, and sleep deprivation. Dmitlag convicts who passed away exhausted by the conditions created at the camp remain present underwater, but are missing from the archival record. This disturbing discovery exposes the gap between the documents stored in the archives and the evidence collected from the construction site, proving the claims made by independent researchers who have challenged the official death toll figures.[79]

Yet Sharpe also explores how residues produced by violent "weather" are being preserved by other conditions, which resist the "total climate" and which she defines as "microclimates."[80] She invites us to think of residence time in the water that prolongs the existence of the bodies at sea—and, therefore, in the world—and depends on the properties of the elements that compose the aquatic environments where these bodies rest. In the Moscow Canal, the corporeal presence of Dmitlag convicts is maintained by the residence time of the elements like water, soil, sand, and other matter. In this capacity, the waterway itself operates as a body that preserves the entities sedimented on its bottom in the brutality of the dominant "weather." Besides challenging the imperatives of such a "weather," illuminating forms of resistance inherent to the canal allows us to imagine the waterway as a documentary site.

The Flow as the Archive

A body of water can be approached as an archive and create forms of narration that contribute to existing narratives and/or challenge their assumptions. The concept of material witness and its epistemological propositions provide an opportunity to study some of the records enclosed in the Moscow Canal and offer a way to fill the voids in its fragmentary, paper-based archive.

Approaching the flow of the canal as an environmental infrastructure makes it possible to engage the registering agency of the waterway. Rerouting and technologization of the river reorganized, but did not halt, its flow. Still visible today after more than eighty years of exploitation, these transformations express the brutality of the industrial interventions that otherwise remain underrepresented in the archives. Observations of the artificial fluidity of the flow illuminate the canal's capacity to disclose its residues. Encountered as fossils within the geological materiality, they inspire the creation of speculative stories that acknowledge the incompleteness of existing narratives and propose to undo them for the possibilities of nonextractive futures. The canal also functions to preserve. As a set of conditions resistant to the dominant "weather" of Soviet industrialization, it manages the residence time of its sediments in water and subverts their timescales. By extending temporalities of these bodies, the flow extends their evidencing capacity and thus hints at the vulnerabilities of the weathering modes that produce archival files.

Studies of the waterway have revealed the possibilities that the yet-unarchivable nonhuman agents offered to retrieve the missing records of the Moscow Canal and renarrate histories previously dependent on the reductive structures of the archive. In other words, the flow of the aquatic is an archiving body itself and documents a range of interactions. However, to engage with such data, new regimes of perceptibility and representation should be activated, those which recognize water as a material and political body capable of collecting information about violent interventions it experiences and challenging the official narratives that perpetuate the production of violence.

* * *

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Notes

[1] Cynthia A. Ruder, *Building Stalinism: The Moscow Canal and the Creation of Soviet Space* (London: I. B. Tauris, 2018), 64, https://doi.org/10.5040/9781350985612. For the original quote, see Lazar Kaganovich, *Pamyatnye zapiski rabochego, kommunista-bolshevika, profsouznogo, partyinogo i sovetsko-gosudarstvennogo rabotnika* (*The Memoirs of a Working, Communist-Bolshevik, Trade-Union, Party, and Soviet-State Worker*) (Moscow: Vagrius, 1996), 442.

[2] This system of imprisonment was termed *reforging* by Ida Averbakh, who worked as Moscow's deputy prosecutor in the 1930s, and suggested hard, and more frequently, manual work as a way to transform culprits back into reliable citizens, regardless of how serious their crime was. For more details describing this method, see Averbakh, *Ot prestupleniya k trudu* (*From Crime to Labor*) (Moscow: OGIZ, 1936).

[3] By distinguishing different groups of people within the homogeneous notion of "prisoners," this research emphasizes the urgency to address racial, socio-economic, political, and ideological factors that structured hierarchies within Gulag camps and organized working and living conditions for each group accordingly. Though the words *convicts* and *inmates* appear throughout the essay, the author signals her awareness of the challenges implied. For an article that analyzes these distinctions, see Oleg Khlevniuk, "The Gulag and the Non-Gulag as One Interrelated Whole," *Kritika: Explorations in Russian and Eurasian History* 16, no. 3 (2015): 480–85, https://doi.org/10.1353/kri.2015.0043.

[4] Dmitlag is the acronym for the Dmitrov Correctional Camp.

[5] Aleksander Yakovlev, ed., *Stalinskye stroiki Gulaga, 1930–1953* (*The Stalinist's Projects of the Gulag, 1930–1953*) (Moscow: MFD Materik, 2005), 71–77.

[6] Ibid., 77.

[7] Valentin Barkovsky, Mikhail Bulanov, and Sergey Gor can be mentioned among those researchers who have discussed this question in their work.

[8] Oleg Khlevniuk, *The History of the Gulag: From Collectivization to the Great Terror* (New Haven, CT: Yale University Press, 2004), 5–6.

[9] As an employee, Barkovsky had access to the classified archive of the Moscow Canal Authority, where he found proof for his argument. Thereafter, many researchers have referred to this finding without challenging its credibility. During a personal interview conducted in February 2020, Galina Ivanovna Gerke, a guide at the Museum of the Moscow Canal and a former employee of the canal's central management, hesitated to confirm Barkovsky's claim. For

more information, see Valentin Barkovsky, *Tainy Moskva-Volgostroya* (*The Mysteries of the Moscow-Volgostroy*) (Moscow: Typographiya STD RF, 2007), 17–18.

[10] Khlevniuk addresses the problem of archival credibility and the implied research challenges in the introduction to *The History of the Gulag*, 2–8.

[11] As was discovered by the GULAG History Museum in 2018, some records are being destroyed while staying concealed. See Anastasiya Kurilova, "Terror snimaut s arkhivnogo ucheta" ("Removing Terror from the Archival Records"), *Kommersant*, no. 99 (2018): 1.

[12] These works were mainly published during the construction period and encompass technical reports, such as eleven volumes of *Moscow–Volga Canal, 1932–7*, by NKVD Office of Technical Reports; operation manuals; tourist guides, like *Na Teplohode po Kanalu imeni Moskvy* (*By Boat on the Moscow Canal*), by B. Paskhin; and agitational fiction, such as *Volga idet v Moskvy* (*The Volga Flows to Moscow*), by P. Lopatin.

[13] *Kanal Moskva-Volga: Khronika volzhskogo rayona gidrosooruzheniy* (*The Moskva-Volga Canal: The Chronicle of Hydraulic Structure in the Volzhsky District*) by Mikhail Bulanov; *Byla li tachka u ministra?* (*Did the Minister Have a Barrow?*) (Dimitrov: Spas, 1997), by Nicolay Fedorov; *The Canal, 1932–1937* by Gor, can be mentioned among other publications produced by local historians.

[14] The online project "Moskva-Volga" illustrates how numerous artifacts discovered by local historians are being analyzed without critical reworking of the Soviet socialist world-building narrative. To explore the project, see Igor Kuvyrkov and Sergey Gaev, "Moskva-Volga: Istoria stroitelstva kanala Moskva-Volga" ("Moskva-Volga: The History of the Moskva-Volga Canal Construction"), Moskva-Volga.ru, accessed July 5, 2021, http://moskva-volga.ru.

[15] Ruder, *Building Stalinism*.

[16] Ibid., 1–3.

[17] A rare remark that Ruder makes about the challenges of working with the 1930s Soviet narrative can be found in the introduction to the *Building Stalinism* (10).

[18] Susan Schuppli, *Material Witness: Media, Forensics, Evidence* (Cambridge, MA: MIT Press, 2020), 3, https://doi.org/10.7551/mitpress/9953.001.0001.

[19] Ibid., 20.

[20] This proposal both draws on and adds to the works by researchers who have studied Soviet colonial policymaking, such as Vitaly Chernetsky and Viatcheslav Morozov, and those who have investigated ethnic deportations, kulak exile, special colonies and settlements, and other forms of Gulag forced-labor organization, like Oxana Klimkova and many others.

[21] Judith Pallot, among various scholars, has thoroughly explored this topic. See Sarah Badcock and Judith Pallot, "Russia and the Soviet Union from the Nineteenth to the Twenty-First Century," in *A Global History of Convicts and*

Penal Colonies, edited by Clare Anderson (London: Bloomsbury, 2018), 271–306, http://dx.doi.org/10.5040/9781350000704 .

[22] The literature that compares the Holocaust and Gulag systems is voluminous. See Michael Geyer and Sheila Fitzpatrick, eds., *Beyond Totalitarianism: Stalinism and Nazism Compared* (New York: Cambridge University Press, 2009), https://doi.org/10.1017/CBO9780511802652.001.

[23] See *Gulag Voices: Oral Histories of Soviet Incarceration and Exile* and other works by Jehanne M. Gheith for one account of this question.

[24] The canal acquired its current name in 1947 to honor the eight hundredth anniversary of Moscow.

[25] *XV syezd Vsesouznoy Communisticheskoy Partii (b): Dekabr 1928 goda; Stenographicheskyi otchet* (*XV Congress of the All-Union Communist Party (b): December 1928; The Stenography*) (Moscow: Gosizdat, 1928), 783–814.

[26] The literature that engages with Soviet planned economy and industrialization project in particular is ample. For one detailed analysis of industrialization in Soviet Russia, see seven volumes of *The Industrialization of Soviet Russia*, edited by Robert William Davies. To explore each mentioned megaproject separately, see *The Generation of Power: The History of Dneprostroi* (New York, Oxford: Oxford University Press, 1988), by Anne Dickason Rassweiler; *Magnetic Mountain: Stalinism as a Civilization* (Berkeley: University of California Press, 1997), by Stephen Kotkin; and *Making History for Stalin: The Story of the Belomor Canal* (Gainesville: University Press of Florida, 1998), by Cynthia Ruder.

[27] For a detailed description of the General Reconstruction Plan of the City, see Karl Schlögel, *Moscow, 1937* (Cambridge: Polity, 2012). For the original text, explore Ya. Tsvankin, *Generalnyi plan rekonstruktsii goroda Moskvy* (*General Plan of Moscow Reconstruction*) (Moscow: Poligrafkniga, 1936).

[28] GOELRO is a transliterated acronym that stands for the State Commission for Electrification of Russia, a body that supervised the county's electrification project.

[29] A. Berezinskiy, *Kanal Moskva-Volga, 1932–1937* (*The Moscow-Volga Canal, 1932–1937*) (Moscow: Gosudarstvennoe Izdatelstvo Stroitelnoy Literatury, 1940), 21–22.

[30] Ibid., 26.

[31] Semen Firin and Serey Zhuk, *Kanal Moskva-Volga* (*Moskva-Volga Canal*) (Dmitrov: Typo-lytographia imeny Vorovskogo, 1936), 14.

[32] For a thorough analysis of this topic, see the works by Paul R. Josephson, in particular, *Industrialized Nature: Brute Force Technology and the Transformation of the Natural World* (Washington D. C.: Island, 2002).

[33] Ruder discusses the role of water for the Soviet statecraft in her publication on the Moscow Canal. See Ruder, "Water as Power: Real and Imagined," in *Building Stalinism*, 21–57.

[34] SNK decree no. 859, June 1, 1932, "O stroitelstve vodnogo kanala Volga-Moskva" ("On the Construction of the Volga-Moscow Waterway"), in Yakovlev, *Stalinskye stroiki Gulaga*, 82.
[35] Gor, *Canal*, 24–25.
[36] Stefano Harney and Fred Moten, "Fantasy in the Hold," in *The Undercommons: Fugitive Planning and Black Study* (Wivenhoe, NY: Minor Compositions, 2013), 91–93.
[37] Ibid., 92.
[38] When referring to Soviet Union as Soviet modernity, the essay draws on the works by Madina Tlostanova, a pioneer of decolonial thought in post-Soviet Russia. For instance, see Tlostanova, "Russia within the Frame of Imperial and Colonial Differences," in *A Janus Faced Empire* (Moscow: Block, 2003).
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[40] Yakovlev, *Stalinskye stroiki Gulaga*, 71–77.
[41] SNK decree no. 2640, December 7, 1933, "O Kanale Volga-Moskva" ("On the Moscow Canal") and SNK decree no. 2011, September 7, 1933, "O stroitelstve Kanala Moskva-Volga" ("On the Construction of the Moscow Canal"), both in Yakovlev, *Stalinskye stroiki Gulaga*, 85–89.
[42] Leonid Borodkin, "Trud v GULAGe: mezhdu prinuzhdeniem i stimulirovaniem" ("Labour in the Gulag: Between Compulsion and Incentive"), in Leonid Borodkin, Paul Gregory, and Oleg Khlevniuk, *Gulag: Ekonomika prinuditelnogo truda* (*The Gulag: The Economy of the Forced Labor*) (Moscow: ROSSPEN, 2008), 153.
[43] GARF. R-9489.2.1: 23.
[44] For a comparative reading of two works that present an overview of the Gulag studies before and after the opening of archives, see Andrea Graziosi, "The New Soviet Archival Sources: Hypotheses for a Critical Assessment," *Cahiers du Monde Russe: Russie, Empire Russe, Union Soviétique, États Indépendants* 40, nos. 1–2 (1999): 13–63, https://doi.org/10.3406/cmr.1999.990; and Sheila Fitzpatrick, "Impact of the Opening of Soviet Archives on Western Scholarship on Soviet Social History," *Russian Review* 74, no. 3 (2015): 377–400, https://doi-org.oca.ucsc.edu/10.1111/russ.12021.
[45] Decree no. 658, June 23, 1992, "O snyatii ogranichitelnyh grifov s zakonodatelnyh i inyh aktov, sluzhivshih osnovaniem dlya massovyh repressii I posyagatelstv na prava cheloveka" ("On Declassifying Legislative and Other Decrees That Served as the Basis for Mass Repressions Human Rights Violation"), in *Vedomosti syezda noridnyh depytatov Rossiiskoy Federatsii I Verhovnogo Soveta*

Possiiskoy Federatsii (*The Statements of the Congress of People's Deputies of the Russian Federation and the Supreme Soviet of the Russian Federation*), no. 26 (1992): 1510.

[46] Varlam Shalamov, "Condensed Milk," in *Kolyma Tales* (New York: W. W. Norton, 1980), 80–85.

[47] Many monographs have recently been written on the artistic production at the Gulag. See, for instance, the collection of essays by Fedorov discussing the life of writers, poets, and artists at the Moscow Canal: *Did the Minister Have a Barrow?*

[48] For an extensive overview of different forms of the Gulag memory, see Irina Shcherbakova, "Remembering the Gulag: Memoirs and Oral Testimonies by Former Inmates," in *Reflections on the Gulag: With a Documentary Appendix on the Italian Victims of Repression in the USSR*, edited by by Elena Dundovich, Francesca Gori, and Emanuela Guercetti (Milan: Fondazione Giangiacomo Feltrinelli, 2003), 187–208.

[49] Andrea Gullotta analyzed in detail the topic of trauma in the Gulag literature in "Trauma and Self in the Soviet Context: Remarks on Gulag Writings," *Autobiografia*, no. 1 (2012): 73–87.

[50] Simon Ertz, "Lagernaya systema v 1930e–1950e gody: Evolutsiya struktury i printsipov upravleniya" ("The Camp System in the 1930s–1950s: The Evolution of the Statecraft Structure and Principles"), in Borodkin, Gregory, and Khlevniuk, *Gulag*, 91.

[51] Andrew Barry, "Materialist Politics: Metallurgy," in *Political Matter: Technoscience, Democracy, and Public Life*, edited by Bruce Braun and Sarah J. Whatmore (Minneapolis: University of Minnesota Press, 2010), 89–117.

[52] Bernadette Bensaude-Vincent and Isabelle Stengers, *A History of Chemistry* (Cambridge, MA: Harvard University Press, 1996), 206.

[53] To engage with their work, see Astrida Neimanis, *Bodies of Water: Posthuman Feminist Phenomenology* (London: Bloomsbury Academic, 2017), https://doi.org/10.5040/9781474275415.ch-001; Melody Jue, *Wild Blue Media: Thinking through Seawater* (Durham, NC: Duke University Press, 2020), https://doi.org/10.1215/9781478007548; and Stacy Alaimo, *Bodily Natures: Science, Environment, and the Material Self* (Bloomington: Indiana University Press, 2010).

[54] Stefan Helmreich, "Nature, Culture, Seawater," *American Anthropologist* 113, no. 1 (2011): 133, https://doi.org/10.1111/j.1548-1433.2010.01311.x.

[55] For a detailed analysis of these methodological approaches to the water, see Philip Steinberg, "Of Other Seas: Metaphors and Materialities in Maritime Regions," *Atlantic Studies* 10, no. 2 (2013): 156–69, https://doi.org/10.1080/14788810.2013.785192.

[56] Starting here, all figures are calculated according to the Baltic Sea level.

[57] Firin and Zhuk, *Kanal Moskva-Volga*, 20.

[58] Stefan Helmreich, "How to Hide an Island," in *New Geographies, 8: Island*, edited by Daniel Daou and Pablo Pérez-Ramos (Cambridge, MA: Harvard Graduate School of Design, 2017), 84.
[59] Ibid.
[60] By juxtaposing "technologies" and "techniques" as separate notions, the research follows John Durham Peters and his thinking about sea mediums. Peters suggests that technologies are crafted by the human species, while techniques are tools inherent to one's body—either human or nonhuman. This essay proposes thinking similarly about the canal: with some of the processes being organic to the waterway and others acquired artificially. See Peters, "Of Cetaceans and Ships; or, The Moorings of Our Being. The Marvelous Clouds," in *Towards a Philosophy of Elemental Media* (Chicago: University of Chicago Press, 2015), 53–114, https://www-degruyter-com.oca.ucsc.edu/document/doi/10.7208/9780226253978-003/html.
[61] Helmreich, "How to Hide an Island," 84.
[62] Various books, journals, and touristic brochures were produced to describe the completion of the canal and include this project in the major narrative of Soviet development. To explore some of them, see A. V. Kosarev, ed., *USSR under Construction*, vol. 2 (1938); P. Lopatin, *Volga idet v Moskvy* (*The Volga Comes to Moscow*) (Moscow: Moskovskiy Rabochiy, 1938); and N. Komarovskiy, *Kanal Moskva-Volga* (*The Moskva-Volga Canal*) (Moscow: OGIZ Gostranstechizdat, 1937).
[63] Dmitry Bulanin, *Goroda Tverskoy oblasti: Istoriko-arhitekturnye ocherki* (*Towns of Tver Oblast: Cities of the Tver Region; Historical Essays*) (Moscow: GII, 2007), 135.
[64] Berezinskiy, *Kanal Moscow-Volga*, 278.
[65] K. I. Schetchikov collected and published a few historical accounts of Korcheva written between the eighteenth and twentieth centuries. See Schetchikov, "Korcheva v istochnikax XVIII–XX vekov" ("Korcheva in Sources of the Eighteenth–Twentieth Centuries"), in *Korchevskaya starina* (*Ancient Korcheva*), vol. 3 (1997), 40–56.
[66] Only official publications, such as *Na Shturm Trassy* magazine distributed strictly inside the Dmitlag, and archival documents presenting numbers and dates of the town's submergence were available during the research. This obstacle complicated the search for the residents' experience of forced relocation, which was either missing from both sources or depicted as a positive event. That is why the essay does not develop further this question.
[67] Kathryn Yusoff, "Geologic Realism: On the Beach of Geologic Time," *Social Text* 37, no. 1 (2019): 12–13, https://doi.org/10.1215/01642472-7286240.
[68] Ibid.
[69] Kathryn Yusoff, *A Billion Black Anthropocenes or None* (Minneapolis: University of Minnesota Press, 2018), 105.

[70] These gatherings are mentioned in the local historians' project *Konakovskiy Uezd*. For more information, see "Ot Korchevy do Konakovo" ("From Korcheva to Konakovo"), *Konakovskiy Uezd*, accessed September 5, 2020, https://konakovsky-uezd.org/stroies/.

[71] Yusoff, "Geologic Realism," 13.

[72] Barkovsky, *Tainy Moskva-Volgostroya*, 22–23.

[73] Bulanov, Fedorov, and Gor describe the organization of mass graves at the construction site in a similar way to Barkovsky.

[74] Barkovsky, *Tainy Moskva-Volgostroya*, 22–23.

[75] Sergey Zhuk, ed., *Kanal Moskva-Volga, 1932–1937: Zemlyanye Raboty* (*Moskva-Volga Canal, 1932–1937; Excavation Works*) (Moscow: Gosudarstvennoe Izdatelstvo Stroitelnoy Literatury, 1940), 11.

[76] Christina Sharpe, "The Weather," in *In The Wake: On Blackness and Being* (Durham, NC: Duke University Press, 2016), 131–44, https://doi.org/10.1515/9780822373452.

[77] Ibid.

[78] Léopold Lambert and Christina Sharpe, "Antiblack Weather vs Black Microclimates," *The Funambulist*, no. 14 (2017): 50, podcast transcripts.

[79] To explore one of these claims, see *Kanal Moskva-Volga*, by Bulanov.

[80] Lambert and Sharpe, "Antiblack Weather vs Black Microclimates."